	Course Title: **ENGINEERING MECHANICS AND STRENGTH OF MATERIALS**		
	Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE31T**
	Type of Course: **Lectures, Self Study& Student activity**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Prerequisites: Knowledge of basic Mathematics and Science.

Course Objectives: The students shall be able to

1. Define and identify the differences among types of forces, stresses and strains.
2. Determine the geometrical properties of the structural sections and to analyze the effect of geometry on strength properties of structural elements.
3. Evaluate the response and behavior of various materials to forces, stresses and strains and to assess the properties of a material and identify its usage in structural elements.
4. Identify, formulate and solve engineering problems of structural elements subjected to flexure, shear.
5. Provide procedural knowledge to analyses of structural system, component of elements such as beams and columns subjected to various load combinations with different boundary conditions.

On successful completion of this course, the student will be able to

	Course Outcome	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Compare the various forces acting and apply the force equilibrium condition.	R/U/Ap	1,2	5
CO2	Explain the mechanical properties and describe the different types of stress, strains and elastic constants and compute the factor of safety in sustainability of material aspects.	R/U/Ap/Ay	1,2,5,6	10
CO3	Compute geometrical properties of the sections knowing the importance of geometry in structural engineering	R/U/Ap	1,2,,5,9	10
CO4	Correlate the concept of free body diagram, & analyze the different types of end conditions in supports for various loads &beams developing shear force diagram& bending moment diagram,	R/U/Ap/ Ay/ C	1,2, 3, 5,9	10
CO5	Describe Pure bending theory and applying geometrical properties of beam to calculate strength parameters& develop flexural stress and shear stress diagram of structural members (beams) for different loading conditions.	R/U/Ap/ Ay/ C	1,2,3, 5,6,7,9	8
CO6	Inspect and calculate the deformation (Slope &deflection) of basic beams	R/U/Ap/Ay	1,2,5	4
CO7	Explain the types of column and apply the eulers theory to find the parameters for different end condition	R/U/A/Ay	1,2,5,6	5
CO8	Manage the suggested or identified structural engineering problems, formulate and solve in teams, in order to improve future problem solving ability and able to present it.	U/Ay/Ap/ C	1,2,3,4, 5,6,7,8, 9,10	*
			Total sessions	**52**

Legend- R; Remember U: Understand, Ap: Application Ay: Analysis C:Creation,

*Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and Practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Strength Of Materials	3	3	2	1	3	3	1	1	3	1

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

COURSE CONTENT

UNIT	COURSE CONTENTS	HOURS
1	**INTRODUCTION TO ENGINEERING MECHANICS** Force and characteristics of a force, Force system: - Definition, classification of force system according to plane and line of action, Composition of Forces: - Definition, Resultant force, moment of a force,Principle of transmissibility of forces,Law of moments Simple Problems on forces.	6
2	**SIMPLE STRESSES AND STRAINS** Definition of rigid body, plastic body, mechanical properties of metal-(Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue, Tenacity, Durability) Definition of stress, strain, Classification of stress, strain, (Types of stresses -Tensile, Compressive and Shear stresses Types of strains - Tensile, Compressive and Shear strains - Elongation and Contraction - Longitudinal and Lateral strains - Poisson's Ratio) Stress-strain curve for mild steel, HYSD bar and non-ferrous materials, (yield stress/ proof stress, Hooke's law, St. Venant''s principle, Ultimate stress, breaking stress and percentage elongation. Working stress - Factor of safety - Percentage reduction in area - Significance of percentage elongation and reduction in area of cross section), Stresses in bars of composite section (Modular ratio – Problems on axially loaded composite sections like RC.C / Encased columns.) Principles of superposition, Deformation of uniform bars and bars of varying cross-section, Volumetric strain & change in volume, Relation among elastic constants Types of loading – gradual, suddenly applied load & Impact load Definition of strain energy, modulus of resilience and proof resilience. Comparison of stresses due to gradual load, sudden load and impact load. Thermal stresses.	12

3	**GEOMETRICAL PROPERTIES OF SECTIONS** Centroid, centre of gravity, Concept of moment of inertia, Centre of gravity of plane areas such as rectangle, triangle, circle, semicircle and quarter circle. Parallel axis and perpendicular axis theorem, Radius of gyration & polar moment of inertia, problems on C.G of irregular sections, M.I of symmetrical and unsymmetrical sections (I, T, C, L-section) problems,	10
4	**BENDING MOMENTS AND SHEAR FORCE** Types of beams –(simply supported, cantilever, fixed and continuous beams,)Types of loading- (Axial load, Transverse load, point load, uniformly distributed load, uniform varying load moment load) support reactions for determinate structures, End conditions, Concept of shear force and bending moment, sign convention. Relation between bending moment, shear force and rate of loading Shear force and bending moment diagrams for simply supported beams, overhanging beams and cantilever subjected to point loads, UDL, point of contra flexure.	10
5	**THEORY OF SIMPLE BENDING** Introduction – Bending stress in beam, Assumptions in simple bending theory, bending equation, neutral axis, Modulus of rupture, section modulus, flexural rigidity, moment of resistance, Problems on Bending stress distribution diagram-variation of bending stresses across the cross section of the beams only rectangular and T section. Shear Stress distribution diagram for rectangular, I, T-section beams.	6
6	**SLOPE AND DEFLECTION OF BEAMS** Introduction – Definitions of slope, deflection - Slope and deflection using Moment area method for simply supported and cantilever, subjected to symmetrical point loads and UDL.	4
7	**COLUMNS** Introduction – Short and long columns - Euler's theory on columns - Effective length, slenderness ratio - radius of gyration, buckling load - Assumptions, Euler's Buckling load for different end conditions - Limitations of Euler's theory - and problems.	4
	TOTAL	**52**

Course Delivery: The course will be delivered through lectures and Power point presentations/ Video

🎯 SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance the student's knowledge, practical skill, lifelong learning, communication, and modern tool usage.

1. Drawing Shear force and Bending Moment diagrams on Graph Paper simply supported beam, Cantilever and Draw the load diagram (free body diagram) by knowing SFD (each 6 problems).
2. To determine the moments of inertia of the given irregular body, composite sections, built up sections.
3. In spread sheet finding centre of gravity; I_{ZZ} and I_{YY} of I, L,T and channel sections
4. Using MS excel prepare the abstract sheet with given data and calculate moment of inertia using formula bar
5. Writing report on (any one)

a. Study on Deformation behavior of Simply Supported Beam, measurement of Young's Modulus and Deflection of Beam.
b. Conduct a experiment calculating the tensile stress of Bamboo if used as a reinforcing material
c. Calculate the tensile stress induced in the hanging rod of ceiling fan and suggest an alternate material
d. Calculate the tensile stress induced in the rope made up of jute
e. Determine the rigidity modulus of the material of the suspension wire.
f. Determine the flexural strength of the given tile by conducting a bending test
g. Conduct a deflection test on wooden beam and determine the value of Young's Modulus of wood.
h. Draw a graph "load Vs deflection".
i. Conduct a compression test on the given wooden cube and find its ultimate strength parallel to its fibres
j. Maxwell's Theorem of Reciprocal Deflection
k. Write material specifications for any two structural steels.

6. Visit the Institute's Library / internet center and list the books/journals/conference proceedings, e-books and any other resources available on the topics suggested by the teacher. Prepare references consisting name of the author, title of the book/paper, publication and place of publication, volume No.s, page numbers and year of publication(any one). Some examples:
   a) Tensometer,
   b) Strain hardening
   c) Punching shear.
   d) Comparison of Compressive strength of Bricks, Blocks and Concrete.
   e) Tension test on Mild steel and HYSD bars.
   f) Compression test of Mild Steel, Cast iron and Wood.
   g) Bending Test on Wood and Mild steel.
   h) Plastic deflection
   i) Compound stress
   j) Torsion
   k) Thick and thin cylinders
   l) Glass fibres
   m) Carbon fibres
   n) Hoop stress
   o) Varignons theorem
   p) Euler–Bernoulli beam theory
   q) Trusses
   r) Statically indeterminate structures
   s) Prismatic beam

NOTE:
1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows: (Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good4**,** Exemplary **5**)
2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary5				
1.Literature	1				
2.Fulfill team's roles & duties	4				
3.Conclusion	3				
4.Convensions	5				
Total	13				
Average=(Total /4)	3.25				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2.Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

CIVIL

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Thrice test (Average of three tests)	Test 1	20	Blue books	CO1,CO2
					Test 2			CO3,CO4
					Test 3			CO5, CO6,CO7
				Activities		05	Written Report	CO8
	SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5,6,7
Indirect Assessment	Student Feedback on course		Students	Middle of the course			Feedback forms	1, 2,3 Delivery of course
	End of Course Survey			End of the course			Questionnaires	1,2,3, 4 & 5, 6, 7 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Weightage of Marks and blue print of marks for SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE					Marks weightage	weightage (%)	A*	B*
			Cognitive Levels								
			R	U	Ap	Ay	C				
1	Introduction to engineering mechanics	5	33.33%	33.33%	33.34%	0.00%	0.00%	15	10	1	1
			5	**5**	**5**	**0**	**0**				
2	Simple stresses and strains	10	20.00%	20.00%	40.00%	20.00%	0.00%	25	19	1	2
			5	**5**	**10**	**5**	**0**				
3	Geometrical properties of sections	10	20.00%	20.00%	60.00%	0.00%	0.00%	25	19	1	2
			5	**5**	**15**	**0**	**0**				
4	Bending moments and shear force	10	10.00%	10.00%	20.00%	20.00%	40.00%	30	19	2	2
			3	**3**	**6**	**6**	**12**				
5	Theory of simple bending	8	10.00%	20.00%	20.00%	20.00%	30.00%	20	15	2	1
			2	**4**	**4**	**4**	**6**				
6	Slope and deflection of beams	4	20.00%	13.33%	40.00%	26.67%	0.00%	15	8	1	1
			3	**2**	**6**	**4**	**0**				
7	Columns	5	13.33%	20.00%	40.00%	26.67%	0.00%	15	10	1	1
			2	**3**	**6**	**4**	**0**				
	Total	**52**	**18.1%**	**18.6%**	**35.9%**	**15.9%**	**12.4%**	**145**	**100**	**9**	**10**
			25	**27**	**52**	**23**	**18**				

Legend- R; Remember U: Understand Ap: Application Ay: Analysis C: Creation E: Evaluation
   A*-SEE questions to be set for (05marks) in Part – A
   B*- SEE questions to be set for (10marks) in Part – B

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	37
2	Applying the knowledge acquired from the course	36
3	Analysis	16
4	Synthesis (Creating new knowledge)	12
5	Evaluation	0
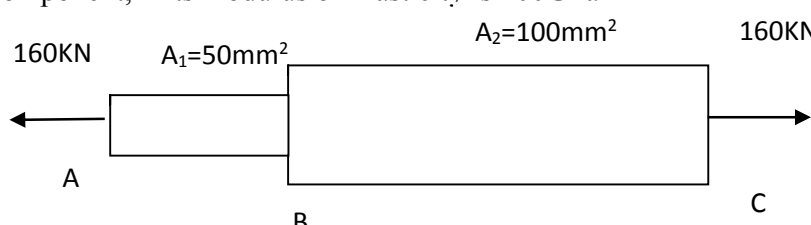
FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year		Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM			20
	Year:			
Name of Course coordinator :				Units:__ CO's:____

Question no	Question	MARKS	CL	CO	PO
1					
2					
3					
4					

Note: Internal choice may be given in each CO at the same cognitive level (CL).

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Model Question Paper for CIE(Tests)

Test/Date and Time	Semester/year		Course/Course Code	Max Marks
Ex: I test/6 th week of sem 10-11 Am	III SEM		Engineering Mechanics And Strength Of Materials	20
	Year: 2015-16		Course code:15CE31T	

Name of Course coordinator :
Course outcome :CO1, CO2   Note: Answer all questions

	Question	M	CL	CO	PO
1	List different classification of force system	4	R	1	1,2
2	Differentiate between moment and couple?	4	U	1	1,2
3	Define: modulus of resilience. A ceiling fan hanging over a rod of 1.50 m long and outer diameter 20mm and thickness 2mm is subjected to an axial pull of 20 KN. If the modulus of elasticity of the material of the rod is 2×10^5 N/mm^2, Determine 1. Stress 2.Strain 3.Elongation of the rod. OR Define: Proof resilience. Determine the total elongation of the component, if its modulus of Elasticity is 200GPa 160KN A$_1$=50mm^2 A$_2$=100mm^2 160KN A B C	6	UAp	2	1,2,5
4	Write an expression between modulus of elasticity and modulus of rigidity ?The ultimate stress for a hollow steel column which carries an axial load of 2MN is 500 N/mm2 .If the external diameter of the column is 250mm, determine the internal diameter Take the factor of safety as 2.	6	R/Ap	2	1,2,6

📕 **TEXT BOOKS**

1. Ramamurtham. S., *"Strength of Materials",* 14th Edition, Dhanpat Rai Publications, 2011
2. Khurmi R S, *"Applied Mechanics and Strength of Materials ",* 5 Edition, S.Chand and company
3 S SBhavikatti, Strength of Materials.
3. Fundamentals of strength of materials by P N Chandramouli" PHI New delhi
4. Basavarajaiah and Mahadevappa, "Strength of Materials", CBS Publishers, New Delhi.
5. Ferdinand Singer, "Strength of Materials", Harper and Row Publications
6. Srinath L S, Prakash Desayi,.Srinivasa Murthy N, S.AnanthaRamu, "Strength of Materials", MacMillan, India, New Delhi.
7.

REFERENCES

1. Madan Mohan das, Mimi das Saikia, Bhargab Mohan das – Basic Engineering Mechanics And Strength of Materials- PHI Learning private limited, New Delhi.
2. Popov E.P, *"Engineering Mechanics of Solids",* 2nd Edition, Prentice-Hall of India, New Delhi, 2002.
3 Nash W.A, *"Theory and problems in Strength of Materials",*Schaum Outline Series, McGraw-Hill Book Co., New York, 1995.
4 Kazimi S.M.A, *"Solid Mechanics"*, Tata McGraw-Hill Publishing Co., New Delhi, 2003.
5 Ryder G.H, *"Strength of Materials",* 3rd Edition, Macmillan India Limited, 2002.
6 Bansal R. K, *"Strength of Materials",*Laxmi Publications, New Delhi, 2012.
7 Timoshenko S.P, *"Elements of Strength of Materials",* Tata McGraw-Hill, Delhi.
8 James M. Gere, "Mechanics of Materials" - (5th Edition), Thomson Learning.
9 Beer & Johnston, "Mechanics of Materials", TATA McGraw Hill.
10 E P Popov, "Mechanics of Solids", Prentice Hall of India.
11 Relevant IS Codes

E–Learning

1. http:// nptel.ac.in
2. http://nptel.ac.in/courses/Webcoursecontents/IITROORKEE/strength%20of%20materials/homepage.htm
3. http://nptel.ac.in/courses/105105108/
4. http://theopenacademy.com/content/strength-materials
5. http://www.slideshare.net/Nuumero1/strength-of-materials-and-mechanics-of-solids-by-r-k-rajput
6. http://www.eng.uokufa.edu.iq/staff/wissam/Strength%20Material-2.pdf
7. http://www.learn2build.in/free/ebooks/appliedstrength.pdf
8. http://engineeringfreedownload.blogspot.jp/search/label/manual

Model Question Paper
Diploma in Civil Engineering
3RD semester
Course title: **STRENGTH OF MATERIALS**

Time; 3Hrs.Max.marks: 100

Part –A
**Answer any six each question carries 5 marks**

1. Differentiate between moment and couple?
2. State "Parallel axis and perpendicular axis" theorem
3. Draw Stress-strain curve for mild steel? Define terms ultimate stress, working stress and factor of safety.
4. Show that cantilever beam with w kN/m UDL overall its length has maximum shear force is $= wl$ and maximum bending moment$= \frac{wl^2}{2}$
5. Name the types of beams, loading and supports with sketches?
6. What are the assumptions in theory of simple bending?
7. State moment area method? Derive an expression for the slope and deflection for a cantilever carrying UDL w/ unit length over the span L by moment area method.
8. Calculate polar MI of square section having 200mm as side.
9. What is effective length of column? With neat sketches mention the length and crippling load of columns for different end conditions?

10. a) Classify force system according to plane and line of action?
    b) Find the horizontal and vertical component of following forces
        A. 20kN acting at an angle 30° to the horizontal
        B. 40kN acting at an angle 60° to the vertical.
11. Find radius of gyration about x-x axis of symmetrical T-section shown in figure

150 mm x 50 mm

150 mm x 50 mm
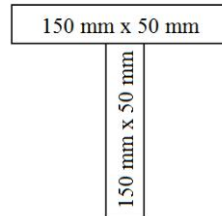
12. a)Compare between centroid and centre of gravity ?
    b)Find the centroid about X-axis and Y-axis for an angle section having dimensions 100 mm x 80 mm x 20 mm. where 100 mm side is vertical
13. Determine the total elongation of the component, if its modulus of Elasticity is 200GPa

A_2=100mm^2

A_1=50mm^2

160KN

160KN

A

B

C
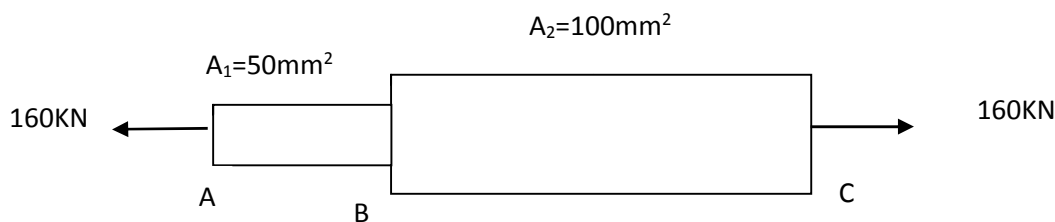
14. A square bar 6mm x6mm in cross section having modulus of rigidity 0.8×10^5 the cross section of the bar is reduced to 5.9991mm x 5.9991mm after the application of tensile load of 3600 N, Determine the modulus of elasticity and poisons ratio.
15. A simply supported beam of a span 6 m carries a udl of 10 KN/m over 4 m length from the left support and a udl of 5 KN/m over remaining length along with a point load of 20KN at 4m from the left support. Draw SF diagram.
16. Draw the bending moment and shear force diagram for the below figure

wKN/m

A

B

C

1m

5m

1m
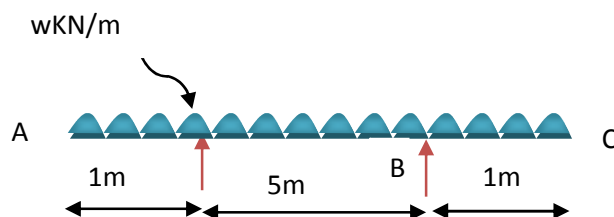
17. Sketch the bending stress distribution diagram across the cross section of a rectangular beam section 230 × 400 m subjected to 60 KNm
18. A column of timber section 150 x 200mm is 6m long, both ends being fixed. Find the safe load for the column. Use Euler's formula and allow a factor of safety of 3 Take E =17500N/mm^2
19. A cast iron beam 50mm wide and 80mm deep is simply supported on a span of 1m .the beam caries a point load of 2kN at the centre. find the deflection at the centre take E=1x 10^5 N/mm^2.

Model Questions Bank

Unit 1-Introduction To Engineering Mechanics
Cognitive level -Remember
What are the characteristics of a force?
Define resultant of a force system?
Cognitive level -Understand
Differentiate between Concurrent and non concurrent force system ?
Differentiate between coplanar and non-coplanar force system?
Differentiate between like parallel and unlike parallel force system ?
Differentiate between moment and couple ?
State the principle of transmissibility of forces
State the conditions of equilibrium?
Cognitive level -Application
Find the horizontal and vertical component of the following forces.

        A. 20kN acting at an angle 30° to the horizontal

        B. 40kN acting at an angle 60° to the vertical

Unit 2-Simple Stresses And Strains
Cognitive level -Remember
What are the Elastic Constants?
Define: Resilience, proof resilience and modulus of resilience.
Define stress and strain.
Define Shear stress and Shear strain.
Define elastic limit.
Define volumetric strain.
Define tensile stress and compressive stress.
Define young's Modulus.
Define modulus of rigidity.
Define thermal stress.
Define Punching shear
Write an expression between modulus of elasticity and modulus of rigidity ?
Define plasticity and stiffness.
Define Poisons Ratio & modular of elasticity.
Write an expression between modulus of elasticity and modulus
What is meant by direct stress?
Explain the terms ultimate stress, working stress and factor of safety.
Cognitive level -Understand
What is Hooke's Law?
Define Poisson's Ratio.
Distinguish between rigid and deformable bodies.
Define Hardness & Brittleness.
Draw stress-strain diagram for ductile material.
Distinguish between lateral strain and longitudinal strain, nominal stress
Distinguish between lateral strain and longitudinal strain, nominal stress
Draw the stress strain curve for ductile material and explain the term ultimate stress.
Define hooks law? Write relation between modulus of elasticity, modulus of rigidity and bulk modulus?

CIVIL

A rod of 1.50 m long and diameter 20mm is subjected to an axial pull of 20 KN. If the modulus of elasticity of the material of the rod is 2 x 105 N/mm2 Determine 1. Stress 2. Strain 3. the elongation of the rod.

The extension in a rectangular steel bar of length 400mm and thickness 10mm is found to 0.21mm .The uniformly in width from 75mm If E for the bar is 2x 105 N/mm2 , Determine the axial load on the bar.

A square bar 30mm of 2.50 m long is subjected to an axial pull of 30 KN. If the modulus of elasticity of the material of the rod is 2x 105 N/mm2 Determine 1. Stress 2. Strain 3. the elongation of the rod

Find the young's modulus of a rod of diameter 30mm and of length 300mm which is subjected to a tensile load of 60 KN and the extension of the rod is equal to 0.4 mm

The extension in a rectangular steel bar of length 400mm and thickness 3mm is found be 0.21mm .The bar width 60mm E for the bar is 2x 105 N/mm2 Determine the load on the bar.

The ultimate stress for a hollow steel column which carries an axial load of 2MN is 500 N/mm2 .If the external diameter of the column is 250mm, determine the internal diameter Take the factor of safety as 2.

A strut as an internal diameter 150mm. what should be the minimum external diameter so that it may carry a load of 1500KN with a factor of safety 4, ultimate stress of steel is 450 N/mm2.

A square steel bar of hollow cross-section subjected to a tensile load of 60KN with an internal dimension 25X25mm. determine thickness of the bar if the ultimate stress in the bar should not exceed 400N/mm2 with a factor of safety 4.

A square bar 6mm x6mm in cross section having modulus of rigidity 0.8 x105 the dimension of the bar is reduced to 5.9991mm x 5.9991mm after the application of tensile load of 3600 N, Determine the modulus of elasticity and poisons ratio.

A BAR shown in figure is subjected to a tensile load of 150kN find the diameter of middle section if the stress is limited to 140N/mm2 also find length of the middle portion if the total elongation of the bar is to be 0.15mm take E= 2x105 N/mm2

Cognitive level -Analysis

A load of 5KN is to be raised with the help of a steel wire. Find the minimum diameter of the steel wire, if the stress is not to exceed 100MPa.

A steel wire of 5mm diameter is bending into a circular shape of 5 m radius. Determine the minimum bending stress induced in the wire. Take E=200GPa.

A hollow steel column of external dia. 260 mm is required to carry on axial load of 2000 kN. If the ultimate stress of steel is 480 N/mm2, calculate the internal dia. of column taking factor of safety as 4.

Rails of 15 m length were laid on the track when the temperature was 200C. A gap of 1.8 mm was kept between two consecutive rails. At what max temperature the rails will remain stress free? If the temperature is raised further by 150C, what will be the magnitude and nature of stresses induced in the rails?

A steel bar 2.5m long is at a temperature of 200c. Find the free expansion of the bar when the temperature of the bar is raised to 650c. Also find the magnitude & nature of stress developed if the expansion is fully prevented.

A bar of 30 mm diameter is subjected to a pull of 60 kN. The measured extension on a gauge length of 200 mm is 0.09 mm and change in diameter is 0.039 mm. Calculate the poison's ratio and modules of elasticity.

For a certain material E=K, calculate G & Poisson's ratio.

A cube 200mm side is subjected to a compressive force of 3.6MN on each face. Calculate E & K if change in volume is 5000mm3. Take μ = 0.28.

A bar ABCD such that AB=0.75m long & 30mm in diameter, BC=0.5m long & 16mm in diameter, CD=0.75m long & 20mm in diameter is subjected to a tensile load of 180kN at its end. Calculate the change in length of the bar. Use E=200kN/mm2

A brass rod 300mm long & 25mm in diameter is fixed inside a steel tube having 45mm as external & 25mm as internal diameter of same length. Calculate the load sheared by each metal if the assembly is loaded with an axial pull of 120kN. Use Es=200kN/mm2, EB=110kN/mm^2

A BAR shown in figure is subjected to a tensile load of 150kN find the diameter of middle section if the stress is limited to 140N/mm^2 also find length of the middle portion if the total elongation of the bar is to be 0.15mm take E= $2x10^5$ N/mm^2

.Determine the total elongation of the component, if its modulus of Elasticity is 200GPa.

A bar 800mm long consists of 3 different cross-sectional areas, first 300mm of its length it is 30mm x 30mm square in section, second 400mm length the bar is 20mm in diameter and 40mm x 40mm square in section for the remaining length if the bar is subjected to an axial tensile load of 60KN determine the stresses in the three parts and the total extension.

A square bar 30mm x30mm in section is subjected to axial forces as shown in figure, find the total change in the bar

A square bar 30mm x30mm in section is subjected to axial forces as shown in figure, find the total change in the bar

CIVIL

<table>
<tr><td colspan="1" align="center">**Unit 4-Bending Moments And Shear Force**</td></tr>
</table>

| **Cognitive level -Remember** |
|---|
| Write the relationship between loading, Shear force & Bending moment. |
| Define with sketches types of loading and supports. |
| Define point of contra flexure |

Cognitive level -Understand
Name the types of beams, loading and supports with sketches?
Come out with the relation between bending moment, shear force and rate of loading

Cognitive level -Application

A simply supported beam of span 'L' is subjected to udl of 'w'/unit length. Draw S.F. diagram. and B.M. diagram. Find maximum shear force and maximum bending moment.

A simply supported beam of span 'L' is subjected to centrally placed W KN. Draw S.F. diagram. and B.M. diagram. Find maximum shear force and maximum bending moment.

A cantilever beam of span 'L' is subjected to udl of 'w'/u nit length. Draw S.F. diagram. and B.M. diagram. Find maximum shear force and maximum bending moment.

Draw the bending moment and shear force diagram for a given figure where weight of man is 84 kg (823.7586 Newton)
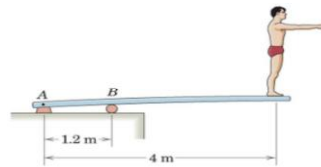
Cognitive level -Analysis

A simply supported beam of 5 meter span carrying point loads 15 KN, 30 KN, 10 KN at distances of 2m, 3m, & 4 meter respectively from the left end. Draw S.F. diagram and B.M. diagram.

State the maximum SF induced in a cantilever of span 4m & carrying a point load of 30kN at its free end.

A cantilever beam 2 meter long carries a UDL of 1.5 KN/m over a length of 1.6 m from the free end. Draw shear force and bending moment diagram for the beam.

Draw the bending moment and shear force diagram for a given figure where weight of man is 84 kg (823.7586 Newton)

Construct the S. F. D. and B. M. D. for the overhanging beam shown in Figure

A simply supported beam of a span 6 m carries a udl of 10 KN/m over 4 m length from the left support and a udl of 5 KN/m over remaining length along with a point load of 20KN at 4m from the left support. Draw SF diagram.

An overhanging beam ABC, such that span AB = 6 m & overhang BC = 2m carries a UDL of 12 KN/m over entire span ABC and two point loads 10KN at 4m from the left support A & of 5kN at free end C. Draw SF diagram. Draw BM diagram for the beam given in & calculate the point of contra flexure if any.

Cognitive level -Creation
A beam AB 10 m long has hinged supports at its ends A and B .It carries a point load of 5KN at 3 meters from A and a point load of 5KN at 7 meters from A and audl of 1KN per meter between the point loads. Draw S.F. Diagram and B.M. diagram for the beam.

A cantilever beam 1.5 meter long is carrying point loads 1000N each at a distance of 0.5 meter, 1.0 meter, and 1.5 meter from the fixed end. Draw S.F. diagram and B. M. diagram for the cantilever beam.

A simply supported right side overhanging beam supported at 4 meter and right side 1meter overhang. A Loaded by udl 10 KN /m over entire span. Draw S.F. diagram and B.M diagram.

Construct the S. F. D. and B. M. D. for the cantilever beam shown in Figure

A simply supported beam of a span 7 m carries audl of 5 KN/m over 4 m length from the left support and a point load of 50 KN at 2m from the right support. Draw SF & BM diagram.

A Cantilever of span 3 m carries audl of 4 KN/m over entire span and a point load of 5 KN at 2m from the support. Draw SF and BM diagrams.

Construct the S. F. D. and B. M. D. for the overhanging beam shown in Figure
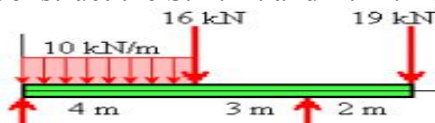
Construct the S. F. D. and B. M. D. for the cantilever beam shown in Figure
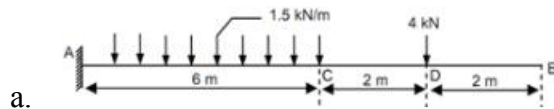
a.

A)For fig 1Show that maximum shear force is $= \frac{wl}{2}$ and maximum bending moment$= \frac{wl^2}{8}$

    b.   b) Draw SFD and BMD for figure 2

       1.   2.
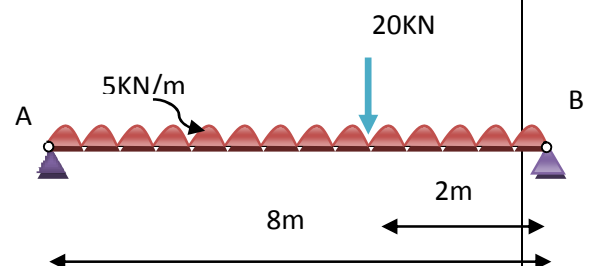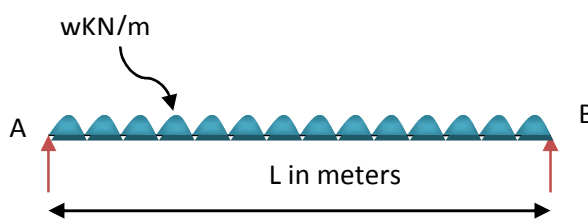
Unit 3-Geometrical Properties Of Sections		
Cognitive level -Remember		
Define centre of gravity		
Define centroid		
Cognitive level -Understand		
State Parallel axixtheorm with neat sketch and equation		
State Perpendicular axixtheorm with neat sketch and equation		

| Cognitive level -Application |
|---|
| An isosceles triangular section ABC has a base width 80 mm and height 60 mm. Determine the M.I. of the section about centre of gravity of the section and the base BC. |
| Calculate the MI of circle about XX & YY axis if MI about ZZ axis is 5 x 1012 mm4.Calculate the MI of a rectangular section of size 120mm x 80mm about its longer side. |
| Calculate the MI of a T-section about the Centrodial axis XX. The top flange is 1200 x 200mm & web is 1800 x 200mm. Total height of the section is of 2000mm. |
| Calculate the MI of an angle section about the Centro dial axis YY. The longer leg is 150 x 20mm & shorter leg is 100 x 20mm. The longer leg is kept vertical. |
| Calculate the centre of gravity of the section shown in fig . |
| Find M.I. of a square 100 mm size about their diagonal. |
| Find M.I. about x-x axis of T-section having flange 150 mm x 50 mm and web 150 mm x 50 mm, overall depth 200 mm. |
| An I-section have the following dimensions Top flange 60 mm x 20 mm. bottom flange 100 mm x 20 mm, web 100 mm x 20 mm, overall depth 140 mm .Find the M.I. about y-y axis. |
| An angle section having dimensions 100 mm x 80 mm x 20 mm. Find M.I. about y-y axis, where 100 mm side is vertical. |
| An isosceles triangular section ABC has a base width 80 mm and height 60 mm. Determine the M.I. of the section about c.g. of the section and the base BC. |
| Calculate the centre of gravity of the section shown in fig .a,b,c,d |
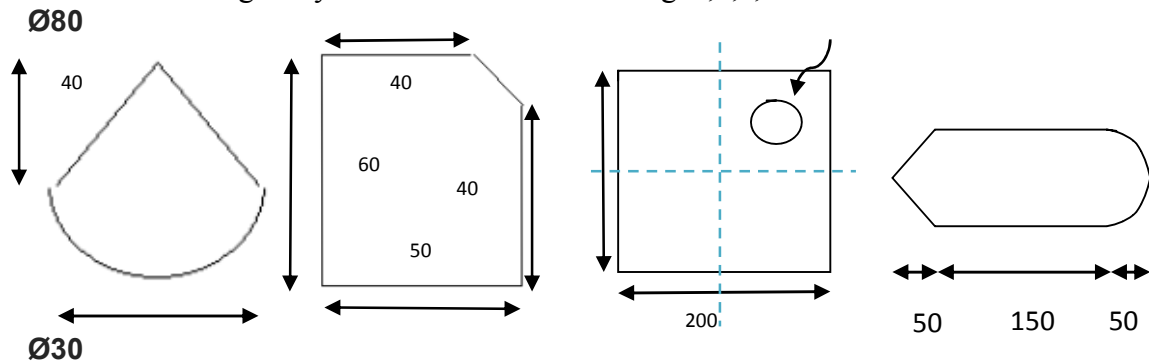
Unit 5-Theory Of Simple Bending
Cognitive level -Remember
What is meant by moment of resistance and neutral axis?
Draw shear stress distribution diagram for circular section and define average shear stress.
Define Neutral axis.
Define direct stresses & bending stresses.
Define moment of resistance.
Define shear stress.
Write the Equation for M.I. of Hollow Shaft.
Draw stress distribution diagram if a rectangular section is subjected to direct & bending stresses
Cognitive level -Understand
Differentiate between a) neutral axis and neutral layer b) Moment of resistance and bending moment
State any four assumptions made in the theory of simple bending.
Cognitive level -Application

CIVIL

A T-beam having flange 200 x 50mm and a web of 200 x 50mm with overall height 250mm is subjected to a shear force of 120kN. Calculate the shear stresses induced in the section & draw the stress distribution diagram. Take I = 1.15x108 mm4 and Ȳ =87.5mm from bottom. Calculate polar MI of square section having 200mm as side.

Cognitive level -Analysis

A simply supported beam of a span 5.8 m is having a cross section of 200 mm wide and 500 mm deep. Calculate the intensity of uniformly distributed load the beam can carry if the bending stress is not to exceed 25 N/mm2.

Cognitive level -Creation

For a T - section with dimensions flange width 100mm, Depth = 200mm and uniform thickness of 40mm. obtain shear stress distribution and calculate maximum and average shear stresses if it is subjected to a S.F. = 100 KN.

Sketch the bending stress distribution across the cross section of a rectangular beam section 230 × 400 m subjected to 60 KNm

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Unit 6-Slope And Deflection Of Beams
Cognitive level -Remember
write the relation between slope, deflection and radius of curvature.
Define slope
Define deflection
Cognitive level -Understand
State moment area method
Cognitive level -Application
A simply supported beam span l meters carries a uniformly distributed load of intensity w kN/m distributed all over its length. Determine the maximum deflection and compare, when same beam with point load at centre of span .

Unit 7-Columns
Cognitive level -Remember
State the effective length for both end hinged column.
Define radius of gyration.
Cognitive level -Understand
Write the assumptions made in the Euler's column theory.
Define slenderness ratio? state the Limitations of Euler's theory?
Cognitive level -Application
Determine the slenderness ratio for steel column of solid circular section of diameter 150mm and 3.5m effective length
Cognitive level -Analysis
A circular column having 500mm diameter is carrying a load of 180kN at an eccentricity of 300mm from the centrodial axis. Determine the maximum & minimum stresses induced in the section.
A hollow cast Iron column having external dimensions 200 x 200 mm and internal dimensions 120 x 120 mm is subjected to a load acting at 50mm from the centrodial axis. Calculate the maximum load the column can carry if permissible stresses in Compression and tension are 600 N/mm2 & 30 N/mm2respectively.

CIVIL

	Course Title: **WATER SUPPLY ENGINEERING**		
	Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE32T**
	Type of Course: **Lectures, Self Study & Student activities**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Prerequisites: Basic knowledge of environmental science and mathematics.

Course Objectives: It aims at enabling the student to understand the various components of environment in and around the earth crust and understand the effects of it over plants, animals, etc.

1. Understand the important concepts of good water supply system to a city/town or a village.
2. To understand the need of conservation of rain water and its applications.
3. To understand the sources, effects, prevention and control measures of water pollution and its legislative aspects.

On successful completion of this course, the student will be able to

	Course Outcome	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Relate the relations between the environment and ecology, estimating water requirement for public water supply scheme.	**R/U/A**	1,2,5,6,10	15
CO2	Ascertain the quality of water as per BIS and select the appropriate treatment method required for the water source.	**R/U/A**	1,2,3,6,10	14
CO3	Study and Establish the suitable distribution system for a locality and know the appurtenances used.	**U/A**	2,4,5,8	07
CO4	Identify and summarize the arrangement of water supply and fittings in a building.	**U/A**	2,4,6,8,9	06
C05	Determine the need of conservation of water and rural water supply.	**U/A**	1,2,4,5,6,7,10	05
C06	Identify the sources of water pollution and suitable control measures.	**U/A**	1,5,6,7,10	05
C06	Perform suggested activity	**U/A**	1 to 10	*
		Total sessions		**52**

Legend- R; Remember   U: Understand   Ap: Application   Ay: Analysis   C:Creation   E: Evaluation
* Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Mapping of COs with POs	PROGRAMME OUTCOME									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic Knowledge	Discipline Knowledge	Experiments & practic	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Lifelong learning
WATER SUPPLY ENGINEERING	3	3	2	2	3	3	1	2	1	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq$40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

UNIT	COURSE CONTENT	HOURS
1	**ENVIRONMENT AND ECOLOGY:** Atmosphere, Lithosphere, Hydrosphere, Biosphere. Relation between Plant, Animals and Environment. Eco System, Man and Ecology. **WATER REQUIREMENT:** Necessity of water supply, Methods of population forecasting (Arithmetical, Geometrical and Incremental Increase method), Water Requirements for a) Domestic Purpose b) Industrial Use c) Fire Fighting d) Public Purpose e) Losses. Per Capita Demand and Factors affecting it. Total Quantity of Water Required for a Town. **SOURCES OF WATER:** Surface Sources - Lakes, Streams, Rivers. Impounded Reservoirs. Underground Sources - Infiltration Galleries, Infiltration Wells and Springs. **INTAKE AND CONVEYANCE OF WATER:** Types of intakes i) Reservoir intake ii) River intake iii) Canal intake, Conveyance of Water - Open Channels and Pipes. Pipe Materials - Cast Iron Pipes, Steel Pipes, Concrete Pipes, Pre-Stressed Concrete Pipes, Merits and Demerits. Pipe Joints - Spigot and Socket Joint, Flange Joint, Universal Pipe Joint, Expansion Joint, Flexible Joint, Various stages of pipe laying and its testing. Pipe corrosion and remedial measures	15
2	**QUALITY OF WATER:** Impurities of water - organic and inorganic classification and examination of water. Physical - temperature, colour, turbidity, taste and odour. Chemical - pH Value, Total Solids, Hardness, Chlorides, Iron and Manganese, Fluoride and Dissolved Oxygen. Bacteriological - E-coli, Most Probable Number (MPN), Quality Standards for Domestic purpose as per BIS. **TREATMENT OF WATER:** Flow diagram of different units of treatment, brief description of constructional details, working and operation of the	14

UNIT	COURSE CONTENT	HOURS
	following units - plain sedimentation, sedimentation with coagulation, flocculation, filtration-Slow sand filters, Rapid sand filters and pressure filters (no design) Disinfection of water, Chlorination.	
3	**DISTRIBUTION SYSTEM:** General Requirements, Systems of Distribution - Gravity System, Combined System, Direct Pumping. Methods of Supply - Intermittent and Continuous. Maintenance of required pressure in Distribution Systems. Storage - Underground, Ground Level And Overhead Service Reservoirs – Sketch, Necessity and Accessories. Types of lay-out : dead end, grid iron, radial and ring systems, their merits and demerits and their suitability **APPURTENANCES IN DISTRIBUTION SYSTEM:** Use of Sluice Valves, Check Valves, Air Valves, Scour Valves, Zero Velocity Valves, Fire Hydrants, Water Meter.	7
4	**WATER SUPPLY ARRANGEMENT IN BUILDINGS:** General lay-out of water supply arrangement for single and multi- storied buildings as per B.I.S code of practice. Pipe Materials - Plastic Pipes, High Density Polythene Pipes, Densified cast iron pipes, Merits and Demerits. Connections from water main to buildings. Water supply fittings - their description and uses, water main, service pipes, supply pipe, distribution pipe, domestic storage tank, stop cock, ferrule, goose neck, water tap, Modern systems of Potable water purification-(RO, UV, Activated carbon), Hot water supply - electric and solar water heaters.	6
5	**WATER CONSERVATION:** Conservation of rain water, roof water harvesting, recharging of ground water. **RURAL WATER SUPPLY:** Rural water supply systems, Disinfection of well water.	5
6	**WATER POLLUTION AND CONTROL:** Sources of water pollution, types and its effects, Prevention and control measures of water pollution, Legislation with regards to water pollution control.	5

Course Delivery: The course will be delivered through lectures and Power point presentations/ Video

SUGGESTED LIST OF STUDENT ACTIVITIES

1. Collect the information about biotic and abiotic components of surrounding environment and frame relation among them.
2. Estimate the total quantity of water required for a town/locality/Institute.
3. Prepare map and written report for surface and underground sources of water in the neighbourhood.
4. Visit nearby Intake works of water of your place and collect details.
5. Charts are prepared for BIS and WHO quality standards for drinking water.
6. Visit nearby Certified Water testing laboratories and identify various tests conducted on water.
7. Visit Water Treatment Plant and collect details of unit operations and processes involved in it.
8. Study the distribution system of water supply of your locality.
9. To visit a newly constructed building for plumbing works.
10. Prepare a mini project report for roof top rain water harvesting for existing building

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11. Study about Solar water heater and collect data
12. Prepare report/presentation on issues related to water pollution.

NOTE:

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows: (Unsatisfactory **1,** Developing **2,** Satisfactory **3, Good 4,** Exemplary **5**)

1. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good **4,** Exemplary 5				
1.Literature	1				
2.Fulfill team's roles & duties	4				
3.Conclusion	3				
4.Convensions	5				
Total	13				
Average=(Total /4)	3.25				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

COURSE CONTENT AND BLUE PRINT OF MARKS FOR SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE — Cognitive Levels			Marks weightage	weightage (%)	A*	B*
			R	U	Ap				
1	Environment and ecology, water requirement, sources of water, collection and conveyance of water,	15	16% / 7	35% / 15	47% / 20	42	29	2	3
2	Quality & treatment of water	14	16% / 6	35% / 14	50% / 20	39	27	2	3
3	Appurtenances and distribution system	7	0% / 0	25% / 5	75% / 15	20	13	2	1
4	Water supply arrangement in buildings	6	0% / 0	100% / 17	0% / 0	17	12	1	1
5	Water conservation, rural water supply	5	0% / 0	50% / 7	50% / 7	14	10	1	1
6	Water pollution and control	5	0% / 0	50% / 7	50% / 7	14	10	1	1
	Total	52	5% / 13	49% / 64	45% / 68	145	100	9	10

Legend: R; Remember, U:Understand A:Application Ay: Analysis C:Creation E: Evaluvation
A*-SEE QUESTIONS TO BE SET FOR (05MARKS) in PART – A

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B*- SEE QUESTIONS TO BE SET FOR (10MARKS) in PART – B

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	55
2	Applying the knowledge acquired from the course	45
3	Analysis	0
4	Synthesis (Creating new knowledge)	0
5	Evaluation	0

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three IA tests (Average of three tests will be computed)	Test 1	20	Blue books	1,2,
					Test 2			3,4
					Test 3			5,6
				Student activities		05	Report	1,2,3,4,5,6,7
	SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5,6,7
Indirect Assessment	Student Feedback on course		Students	Middle of the course			Feedback forms	1 & 2,3Delivery of course
	End of Course Survey			End of the course			Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM		20
	Year:		

Name of Course coordinator : Units:__
CO's:____

Question no	Question	MARKS	CL	CO	PO
1					
2					
3					
4					

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	III SEM	WATER SUPPLY ENGINEERING	20
	Year: 2015-16	Course code:15EN32T	

Name of Course coordinator
CO1,CO2
Answer all questions

Question		M	CL	CO	PO
1	List the methods of forecasting population.	3	R	1	1,2,5,6,10
2	Explain with sketch Infiltration Galleries and Infiltration Wells.	7	U	1	1,2,5,6,10
3	Explain with sketches the function, constructional details, working and operations of Aeration & Slow sand filter OR Clarifier & Rapid sand filter	10	A	2	1,2,6,10

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📕 TEXT BOOKS & REFERENCES

1. Water Supply & Sanitary Engineering- by Rangwala.
2. Water Supply Engineering Vol-I - by S.K.Garg.
3. Water Supply & Sanitary Engineering- by Birde.
4. Water Supply Engineering Vol-I - by Gurucharan Singh.
5. Environmental Engg.-Vol-I –by P.N. Modi.
6. Water Supply Engg.-Vol-I – by Fair & Geir.
7. Water Supply, Waste Disposal and Environmental Pollution Engineering-(Khanna publication) A.K.chatterjee .
8. Water Supply Engineering by Dr B.C.Punmia, Jain & Jain.

MODEL QUESTION PAPER (SEE)

Code: 15CE32T

Diploma in Civil Engineering
III Semester
Course title: WATER SUPPLY ENGINEERING

Time: 3 Hours]   **[Max Marks: 100]**

Note: i) Answer any SIX questions from PART - A. Each question caries 05 marks.
ii) Answer any SEVEN Questions from PART - B. Each question caries 10 marks.

PART – A

1. State the factors affecting Per Capita Demand.
2. Explain(i) Hydrosphere (ii) Biosphere
3. State any five BIS standards for drinking water.
4. Describe Break point chlorination
5. Distinguish intermittent system with continuous system of water supply?
6. Explain the functions of Sluice Valves with sketches
7. Distinguish between HDP pipe and CI pipe
8. Explain rural water supply systems.
9. List the Legislative acts to water pollution control

PART – B

1. a) List the sources for pipe corrosion
   b) List the important points in any water supply
2. The following data have been observed from the census department

Sl No	Year	Population
1	1955	6000
2	1965	10000

3	1975	15000
4	1985	20500
5	1995	27000
6	2005	35500
7	2015	45000

    Estimate the population for the year 2025 and 2035 by Arithmetical Increase method.

3. Explain with sketch Infiltration Galleries.
4. Summarise the merits and demerits of different systems of lay-out in a distribution system
5. Explain with sketches the function, constructional details, working and operations of Rapid sand filter
6. Explain Chemical tests conducted on water and their significances
7. Explain with sketches the following systems of lay-outs in distribution system
       i) Dead end; ii) Grid iron;
8. Sketch the constructional details and uses of following water supply fittings:
       i) Ferrule; ii) Goose neck
9. Explain the methods of Recharging ground aquifer
10. Explain the prevention and control of water pollution

MODEL QUESTION BANK

CO 1: Understand relations between the environment and ecology ,estimating water requirement for public water supply scheme.

REMEMBER LEVEL QUESTIONS
1. Define the terms Ecology and ecosystem?
2. Describe how the animals depend on plants?
3. Explain the relations between plant, animals and Environment.
4. List the important points in any water supply scheme.
5. List the methods of forecasting population.
6. State the factors affecting Per Capita Demand.
7. List the sources of water
8. State the different methods of conveyance of water.
9. List the sources for pipe corrosion

UNDERSTANDING LEVEL QUESTIONS

1. Explain Atmosphere, Lithosphere, Hydrosphere and Biosphere?
2. Explain briefly the importance of Ecosystem and ecology.
3. Explain the necessity of water supply.
4. Explain about Per Capita Demand
5. Explain the major sources of water supply scheme?
6. Explain different types of pipe materials used for conveyance of water.

7. Summarise the merits and demerits of (i) C.I pipes (ii) Concrete pipes (iii) Plastic pipes
8. Describe pipe corrosion and its effects?

APPLICATION LEVEL QUESTIONS

1. The following data have been observed from the census department

Sl No	Year	Population
1	1955	6000
2	1965	10000
3	1975	15000
4	1985	20500
5	1995	27000
6	2005	35500
7	2015	45000

Estimate the population for the year 2025 and 2035 by Arithmetical Increase method.
2. Estimate the requirement of water for various uses in a) Domestic uses b) Industrial Use c) Fire Fighting d) Public uses e) Losses.
3. Estimate the total quantity of water required for a town
4. Explain with sketch Infiltration Galleries and Infiltration Wells.
5. Explain with neat sketches, reservoir intake, river intake and canal intake.
6. Explain with neat sketches, different types of pipe joints.
7. Explain the procedure of laying pipes.
8. Explain the method of testing of pipe lines.

CO 2: Ascertain the quality of water as per BIS and select the appropriate treatement method required for the water source.

REMEMBER LEVEL QUESTIONS

1. List the impurities present in water.
2. State any five BIS standards for drinking water.
3. List the different chemicals used in the treatment of water?

UNDERSTANDING LEVEL QUESTIONS

1. Explain Chlorination and its advantages.
2. Explain different forms of chlorination and explain any one.
3. Describe Break point chlorination

APPLICATION LEVEL QUESTIONS

1. Explain physical tests conducted on water and their significances
2. Explain Chemical tests conducted on water and their significances
3. Explain Bacteriological tests conducted on water.
4. Sketch the flow diagram for the water treatment works.

5. Explain with sketches the function, constructional details, working and operations of i) Aeration; ii) Flash Mixer; iii) Flocculator; iv) Clarifier v) Slow sand filter; vi) Rapid sand filter, vii) Pressure filters viii) chlorinating chamber
6. Explain with sketch the chemical feeding devices?
7. Explain the method of determining the dosage of coagulants?
8. Estimate the quantity of alum required by 15MLD of water at treatment plants. When 12 mg/L of alum is required.
9. Calculate the amount of bleaching powder to be required per day to treat 3.0 MLD of water for a town. The percentage of chlorine in bleaching powder is 30%. The chlorine required is 0.4 mg/l to maintain residual chlorine of 0.15 mg/l.

CO 3: Study and Establish the suitable distribution system for a locality and know the appurtenances used.

UNDERSTANDING LEVEL QUESTIONS
1. Distinguish intermittent system with continuous system of water supply?
2. Explain the necessity of service reservoirs.
3. Distinguish underground service reservoirs with overhead service reservoirs
4. Summarise the merits and demerits of different systems of lay-out in a distribution system

APPLICATION LEVEL QUESTIONS

1. Explain with sketches the different systems of distribution i) Gravity distribution; ii) Combined gravity and pumping system; iii) pumping system.
2. Sketch the following i) Rectangular overhead service reservoir; ii) Intz tank showing all the accessories
3. Explain with sketches the following systems of lay-outs in distribution system i) Dead end; ii) Grid iron; iii) Radial; iv) Ring.
4. Judge the suitability of the system of lay-out for a given locality.
5. Explain the functions of the following appurtenances with sketches i) Sluice Valves ii) Check valves or reflex valves; iii) Air valves iv) Drain valves or blow-offs; v) Fire hydrants; vi) water meters.

CO 4: Know the arrangement of water supply and fittings in a building.
UNDERSTANDING LEVEL QUESTIONS
1. Explain the modern systems for portable water treatment
2. Distinguish between HDP pipe and CI pipe.
3. Describe requirements of water supply arrangement for single storied buildings as per B.I.S code of practice

APPLICATION LEVEL QUESTIONS

1. Sketch a general lay-out to show suitable water supply buildings with mains.
2. Explain interior water supply arrangements for a single and multi-storied building as per I. S. Code

3. Sketch the constructional details and uses of following water supply fittings: i) Water main; ii) Service pipe; iii) supply pipe; iv) distribution pipe; v) domestic storage tank; vi) stop cock; vii) Air gap; viii) ferrule; ix) Goose neck; x) Water tap

4. Sketch the general lay-out for hot water supply for a domestic building using both electric water heaters and solar water heaters.

CO 5: Know the conservation of water and rural water supply.
UNDERSTANDING LEVEL QUESTIONS
1. Explain rural water supply systems.

APPLICATION LEVEL QUESTIONS

1   Explain the methods of harvesting of Rain water
2   Explain the methods of Recharging ground aquifer
3   Explain disinfection of well?

CO 6: Identify the sources of water pollution and suitable control measures..
UNDERSTANDING LEVEL QUESTIONS
1   Write Water pollution control acts
APPLICATION LEVEL QUESTIONS
1   Write the causes of water pollution, Sources - Point and Non-point sources, effects on plants and animals
2   Explain the prevention and control of water pollution

	Course Title: **SURVEYING – II**		
	Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE33T**
	Type of Course: **Lectures, and assignments and Student Activity**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Prerequisite: Knowledge of Surveying – I and Mathematics.

COURSE OBJECTIVES :

1. To provide knowledge of basic Principles and application of Theodolite surveying.
2. To develop the techniques of taking measurements using theodolite and Total Station plotting graph and drawings.
3. Setting out centre lines of Column footings of a Framed Structure by using Total Station and Theodolite.
4. Demarcation of boundary of the given land using Total station

COURSE OUTCOMES :

At the end of the course students should be able to

	Course Outcome	CL	Linked PO	Teaching Hrs
CO1	Apply the knowledge of basic concepts and principles of Theodolite.	*R,U,Ap*	1,2,3,4,5	14
CO2	Understand the usage of Theodolite in any civil engineering projects before planning and during execution.	*R,U,Ap, E*	1,2,4,5,8	05
CO3	Understand the principles and use of Tacheometric survey in rough terrain.	*R,U,Ap*	1,2,3,4,8	05
CO4	Interpret data from Theodelite and Total Station in setting out curves.	*R,U,Ap*	1,2,4,5,8	12
CO5	Understand the knowledge of basic concepts and principles of GPS and GIS in Surveying.	*R,U*	1,2,5	04
CO6	Understand the usage and apply the knowledge of Total Station in different field activities.	*R,U,A*	1,2,3,4,5,8	12
CO7	Manage the suggested or identified constructional engineering problems, formulate and solve in teams, in order to improve future problem solving ability and able to present it.	*U/Ap/ Ay/E/C*	1,2,3,4,5,6,7, 8,9,10	*
			Total sessions	**52**

Legend- R; Remember U:Understand Ap: Application Ay: Analysis C:Creation E: Evaluation
* Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
SURVEYING-II	3	3	3	3	3	1	1	3	1	1

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

UNIT	COURSE CONTENTS	HOURS
1.0	**Theodolite Surveying.** Transit Theodolite and its essential parts, terms used in Theodolite surveying, Fundamental Axes and their relations. Temporary adjustments, Measurement of Horizontal angle by Repetition and Reiteration method, Measurement of Vertical angle. Measurement of Deflection angle, Errors in Theodolite surveying. Purpose of a Theodolite Traversing, Traversing by Deflection angle and Included angle method. Checks in Closed and Open Traverse. Traverse computations, Closing error, Balancing the traverse by Bowditch and Transit rules. Omitted measurements-problems (Bearing and distance of one side, length of two sides). Simple Problems on Bowditch and Transit rule, converting Deflection angles into Bearings and interior angles into deflection angles, Computing latitude and departure, given the co ordinates of two points, finding its length and bearing, area of Traverse by independent co-ordinate method.	14
2.0	**Trigonometrical levelling** Applications, Elevations and distances of objects - base accessible and inaccessible single plane method and simple problems. Triangulation-Definition, principles, purpose and classification.	05
3.0	**Tacheometry** Principles and purpose of Tacheometry, advantages and disadvantages, Instruments-Tacheometer, stadia rods & Annalactic lense, Determination of Tacheometric constants. Fixed Hair method of Stadia system- Simple Problems.	05

4.0	**Curves:** Curves- Elements of Curves, relation between Radius and Degree of a curve. Types of curves – Horizontal and vertical curves, Types of horizontal curves-simple, compound, reverse and transition curves. Setting out simple curves by Chord Produced and Rankine's method. Definition and elements of a compound curve. Setting out Compound curve. Definition and elements of a reverse curve. Definition and elements of a Transition curves-objectives and requirements.	12
5.0	**Modern Surveying** Remote sensing – definition, basic principles and its applications, Global Positioning System (GPS) - Fundamentals, working principles, receivers, advantages and disadvantages, working principles of GPS navigator. Introduction to GIS- Objectives, applications, comparison of GIS with CAD.	04
6.0	**Total Station** Introduction – Component parts of a Total Station and Accessories - Summary & characteristic Features of total station - Advantages and disadvantages of total station - Applications, - Setting up the Total Station - Measurement (Distance, Angle, Bearing, altitudes etc.)- Field procedure for co-ordinate measurement - Setting out Lines - Setting out Curve by Rankin's method, to set building corners, to mark control and offset lines, to run a traverse survey & adjustments – Areas of field (three or more points), Linking data files.	12

COURSE DELIVERY: The course will be delivered through lectures and Power point presentations/ Video, demonstrations etc.

🎯 SUGGESTED ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. To set out sewer grades.
2. Compare the measured angles, Levels and Contours from Total station to other surveying instruments.
3. Setting out centre lines of Column footings of a Framed Structure by using Total Station and Theodolite.
4. Comparing Horizontal angles by both methods between same points.
5. Height of a building calculated by vertical angle method shall be verified by measuring the height with a tape taking BM as Plinth.
6. RL's and heights of objects like chimneys and towers shall be compared by both single plane and Double plane methods.
7. Demarcation of boundary of the given land using Total station.
8. Formation of sites in a residential layout.
9. Conduct a closed Traverse and find out the area enclosed.
10. Plot the Curves executed on site (practicals) and compare the parameters from plotted drawings and site execution.

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CIVIL

11. Determine the height of the elevated objects by trigonometrical levelling.
12. Transferring of Centre line alignment from Ground to inside of Tunnel using Total Station and Theodolite.
13. Geographic information system
14. Gis enabled study of artificial recharge structures
15. Creation of base map for water and sewage network for your town using remote sensing and geographic information system

NOTE:

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:

Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good **4,** Exemplary **5.**

2. Reports should be made available along with bluebooks to IA verification officer.

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good **4,** Exemplary5				
1.Organisation	2				
2.Team's roles & duties	3				
3.Conclusion	4				
4.Convensions	5				
Total	14				
Average=(Total /4)	3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

Course Assessment and Evaluation Scheme:

		What	To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Thrice test (Average of three tests)	Test 1	20	Blue books	CO1, CO2
					Test 2			CO3, CO4
					Test 3			CO5, CO6
				Activities		05	Written Report	CO7
	SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment		Student Feedback on course	Students	Middle of the course			Feedback forms	1,2 & 3 Delivery of course
		End of Course Survey		End of the course			Questionnaires	1,2,3, 4,5 & 6 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   *SEE – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Weightage of Marks and blue print of marks for SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE — Cognitive Levels			Marks weightage	weightage (%)	A*	B*
			R	U	Ap				
1	Theodolite Surveying	14	25.00% **10**	25.00% **10**	50.00% **20**	40	27	2	3
2	Trigonometric Levelling	5	20.00% **3**	33.00% **5**	46.66% **7**	15	10	1	1
3	Tacheometric surveying	5	13.00% **2**	20.00% **3**	67.00% **10**	15	10	1	1
4	Curves	12	12.50% **5**	12.50% **5**	75.00% **30**	40	23	2	3
5	Modern Surveying	4	50.00% **5**	50.00% **5**	0.00% **0**	10	8	0	1
6	Total Station	12	20.00% **5**	40.00% **10**	40.00% **10**	25	23	3	1
	Total	**52**	**20.1%** **30**	**26.2%** **38**	**53.2%** **77**	**145**	**100**	**9**	**10**

Legend- R; Remember U: Understand Ap: Application Ay: Analysis C:Creation E: Evaluation

A*-SEE questions to be set for (05marks) in Part – A

B*- SEE questions to be set for (10marks) in Part – B

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**46**
2	Applying the knowledge acquired from the course	**52**
3	Analysis	**0**
4	Synthesis (Creating new knowledge)	**0**
5	Evaluation	**1**

FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM		20
	Year:		
Name of Course coordinator : CO's:____			Units:__

Q. no	Question	MARKS	CL	CO	PO
1					
2					

| 3 | | | | | |
| 4 | | | | | |

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL Q.P FOR -CIE (TESTS)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/ 6 th week of sem 10-11 Am	III SEM	SURVEYING-II	20
	Year: 2015-16	Course code: 15CE33T	

Name of Course coordinator :   **Course Outcomes : 1 & 2**

Note: Answer all questions

	Questions	M	CL	CO	PO
1	List the fundamental lines of a theodelite and Write the relationship between them.	4	R	1	1,2,4
2	Explain the procedure to find the RL of an elevated object whose base is inaccessible when the instrument axis are at the same level.	5	U	2	1,2,3,4,5
3	Define the following terms. a) Transiting b) Swinging. c) Changing face.	3	R	1	1,2,3
4	a) Calculate latitudes, departures and closing error for the following traverse and adjust the traverse using Bowditch rule. <table><tr><th>Line</th><th>Length</th><th>WCB</th></tr><tr><td>AB</td><td>89.31</td><td>$45^0 10'$</td></tr><tr><td>BC</td><td>219.76</td><td>$72^0 05'$</td></tr><tr><td>CD</td><td>151.18</td><td>$161^0 52'$</td></tr><tr><td>DE</td><td>159.1</td><td>$228^0 43'$</td></tr><tr><td>EA</td><td>232.26</td><td>$300^0 42'$</td></tr></table> **OR** b) An instrument was set up at P and the angle of elevation to a vane 4m above the foot of the staff held at Q was $9^0 30'$. The horizontal distance between P & Q is 2000m. Determine the RL of the Staff station Q given that RL of the instrument axis is 2650.38m by single plane method	8	A	1,2	1,2,3,4,5

REFERENCE TEXT BOOKS

1. Surveying and Levelling Vol- I & II by B C Punmia
2. Surveying and Levelling by T P Kanetkar & S V Kulkarni
3. Surveying and Levelling   by S S Bhavikatti
4. Surveying by Duggal
   5.   Surveying by R Agor

6. Fundamentals of Surveying by S K Roy
7. Sathesh Gopi, R.Sathikumar & N.Madhu, Advanced Surveying, (Total Station, GIS, Remote Sensing), Pearson Education, Chennai, 2007
8. Surveying and Levelling by N N Basak.

E-Learning

http://nptel.ac.in/video.php?subjectId=105104101
http://media.sakshat.ac.in/NPTEL-IIT-Videos/
http://nptel.iitk.ac.in/courses/Civil_Eng/IIT%20Roorkee/Surveying.htm
http://nptel.iitk.ac.in/
http://www.usouthal.edu/geography/allison/GY301/Total%20Station%20Setup%20and%20Operation.pdf
http://www.pentaxsurveying.com/en/pdfs/R400-MANUAL-PTL-EN.pdf
https://www.youtube.com/watch?v=QtEkZPEeeZk
https://www.youtube.com/watch?v=KQgq5xqSTUw

MODEL QUESTION PAPER
DIPLOMA IN CIVIL ENGINEERING
III SEMISTER
COURSE: SURVEYING II

Time : 3Hrs   **Max. Marks : 100**
PART A
Answer any SIX questions each carries 5 marks

1. List the Fundamental lines and their relation of a theodolite.
2. Differentiate between Bowditch rule and Transit rule.
3. Explain the procedure to find the RL of an elevated object whose base is inaccessible when the instrument axes are at the same level.
4. List the advantages and disadvantages of Tacheometric Surveying.
5. Explain briefly different types of Curves with a neat sketch.
6. What is Transition Curve and what are its objects.
7. Explain the principles of Electronic Theodolite & EDM.
8. List the advantages of Total station.
9. What is a Total station? Explain the working principle of Total Station.

PART B
Answer any SEVEN questions each carries 10 marks

1. Calculate latitudes, departures and closing error for the following traverse and adjust the traverse using Bowditch rule.

Line	Length	WCB
AB	89.31	$45^0 10'$
BC	219.76	$72^0 05'$
CD	151.18	$161^0 52'$
DE	159.1	$228^0 43'$
EA	232.26	$300^0 42'$

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2. The following data were recorded in running a traverse, the length of AB and CD have been omitted:

Line	Length in mts	Bearing
AB	?	$33^045'$
BC	300	$86^023''$
CD	?	$169^023'$
DE	450	$243^054'$
EA	268	$317^030'$

Determine the omitted quantities.

3. Define the following terms.
   a. Vertical axis
   b. Trunnion axis
   c. Line of Collimation
   d. Plate level axis and
   e. Altitude level axis

4. An instrument was set up at P and the angle of elevation to a vane 4m above the foot of the staff held at Q was $9^030'$. The horizontal distance between P & Q is 2000m. Determine the RL of the Staff station Q given that RL of the instrument axis is 2650.38m by single plane method.

5. The following Tacheometric observations were made with an annallatic telescope having a multiplying constant 100 on a vertically held staff.

Instrument station	HI	Staff station	Vertical angle	Stadia readings		
A	1.48	BM	$-1^054'$	1.02	1.72	2.42
A	1.48	P	$+2^036'$	1.22	1.825	2.43
Q	1.5	P	$+3^06'$	0.785	1.61	2.435

If the RL of BM is 100.0m, find the RL's of stations A, P & Q.

6. Explain the procedure of setting out a simple circular curve by using Total station.

7. Two tangents intersect at a chainage of 1190m, the deflection angle being 36^0. Calculate the necessary data for setting out a curve with the radius of 300m by Rankines/Deflection angle method. The peg interval is 30m

8. Two straights BA & AC are intersected by a line EF. The angles BEF and EFC are 140^0 & 145^0 respectively. The radius of the first arc is 600m and that of the second arc is 400m. Find the chainage of the tangent points and point of Compound curvature. The chainage of intersection point A is 3415m.

9. What is meant by Remote sensing and What are its basic Principles.

10. Explain the process of transferring the Data collected from Total station to Computer and plot drawing using Auto CAD.

Model Questions Bank

Unit 1- Theodolite Surveying

Cognitive level –Remember

11. List the different purposes for which the theodolite can be used.
12. List the different parts of a Transit theodolite and mention their functions.
13. Draw a neat sketch of the Theodolite and mention the parts.
14. Write the relation between Fundamental lines of a Theodolite.
15. Explain the Temporary adjustments of a Transit Theodolite.
16. What is meant by Theodolite Traversing and list their purposes.
17. Differentiate between Bowditch rule and Transit rule.
18. Differentiate between Consecutive co-ordinates and Independent co-ordinates.
19. What is meant by Balancing the Traverse and Closing error.

Cognitive level –Understand

20. Define the following terms.
    d) Transiting
    e) Swinging.
    f) Face left observation.
    g) Face right observation.
    h) Changing face.
    i) Telescope normal.
    j) Telescope inverted.
21. Define the following terms.
    f. Vertical axis
    g. Trunnion (Horizontal) axis
    h. Line of Collimation
    i. Plate level axis and
    j. Altitude level axis
22. Differentiate between
    a. Face left and Face right observation
    b. Plunging and swinging the Telescope
    c. Tribach and Trivet stage
23. Explain the method of 'Repetition and Reiteration' for measuring the horizontal angle.
24. Explain the principle of a Closed Traverse.
25. Write the procedure for the measurement of Deflection angles.
26. Briefly explain the Theodolite traversing by Included angle method.
27. Briefly explain Theodolite traversing by Deflection angle method.

28. Calculate latitudes and departures for the following traverse ABCDE.

Line	Length	WCB
AB	82.50	$45^0 10'$
BC	200.00	$72^0 05'$
CD	150.30	$161^0 52'$
DE	162.52	$228^0 43'$
EA	234.5	$300^0 42'$

29. Calculate latitudes, departures and closing error for the following traverse and adjust the traverse using Bowditch rule.

Line	Length	WCB
AB	89.31	$45^0 10'$
BC	219.76	$72^0 05'$
CD	151.18	$161^0 52'$
DE	159.1	$228^0 43'$
EA	232.26	$300^0 42'$

30. Find the Latitude and Departure. And Adjust the following traverse by Transit rule.

Line	Length	WCB
AB	89.31	$45^0 10'$
BC	219.76	$72^0 05'$
CD	151.18	$161^0 52'$
DE	159.1	$228^0 43'$
EA	232.26	$300^0 42'$

31. The following data were recorded in running a traverse, the length of AB and CD have been omitted:

Line	Length in mts	Bearing
AB	?	$33^0 45'$
BC	300	$86^0 23''$
CD	?	$169^0 23'$
DE	450	$243^0 54'$
EA	268	$317^0 30'$

Determine the omitted quantities.

Unit 2- Trigonometric Levelling

Cognitive level –Remember
1. Explain the basic principles of Trignometrical Levelling.
2. Differentiate between Trignometrical levelling and Ordinary levelling.
3. What is trigonometrical levelling? Where it is employed?

Cognitive level –Understand

3. What are the practical applications of Trignometrical levelling.

4. Explain the procedure to find the RL of an elevated object whose base is inaccessible when the instrument axes are at the same level.

5. Explain the procedure to find the RL of an elevated object whose base is accessible by single plane method.

6. Explain briefly the method of determining the height of an object by double plane method.

Cognitive level –Application

7. An instrument was set up at P and the angle of elevation to a vane 4m above the foot of the staff held at Q was $9^0 30'$. The horizontal distance between P & Q is 2000m. Determine the RL of the Staff station Q given that RL of the instrument axis is 2650.38m by single plane method.

8. Find the RL of the church Spire C from the following observations taken from two stations A and B, 50m apart,

      Angle BAC= 60^0

      Angle ABC= 50^0

      Angle of elevation from A to top of Spire= 30^0

      Angle of elevation from B to top of spire= 29^0

      Staff reading from A on BM= 2.5m

      Staff reading from B on BM= 0.5m

      RL of BM= 20m.

9. A transit theodolite was set up at a distance of 200m from a chimney and angle of elevation to its top was $10^0 48^{"}$. The staff reading on a BM of RL 70.250m with the telescope horizontal was 0.977. Find the RL of top of Chimney.

Unit 3- Tacheometry

Cognitive level –Remember

1. Explain the Principle of Tacheometry.
2. What are the purpose of Tacheometry.
3. What is Anallatic lense.
4. What is a Stadia Rod.

Cognitive level –Understand

5. List the advantages and disadvantages of Tacheometry.
6. Determine the Tacheometric constants by Fixed hair method

Cognitive level –Application

7. The following readings were taken with a Tacheometer.

Stadia readings	Reading on Staff
Top hair	1.215m
Middle hair	1.650m
Bottom hair	2.085m

If the tacheometric constants K & C as 100 & 0.3m respectively , find the horizontal distance between the staff and instrument and also determine the RL of staff station. Take RL of the instrument station =99.5m & height of the inst above ground =1.220m.

Unit 4- Curves

Cognitive level –Remember

1. Draw a neat sketch of a circular Curve and show its elements.
2. Define degree of a Curve and mention its relation with the radius of curve.
3. Explain briefly different types of Curves with a neat sketch.
4. With a neat sketch define Compound curve and show its elements.
5. Sketch the elements of Reverse curve.
6. What is Transition Curve and what are its objects.
7. What are the requirements of an ideal Transition curve.
8. Explain briefly setting out of a Compound Curve.

Cognitive level –Understand

9. Describe the method of setting out Simple circular curve by deflection angle method (Rankine's method) by using Theodolite.
10. Describe the method of setting out Simple circular curve by deflection angle method (Rankine's method) by using Total Station.
11. Under what circumstances Reverse Curves are provided.
12. What are the points to be considered while setting out a Reverse curve.

Cognitive level –Application

13. Two straights intersect at chainage 2056.44m and the angle of intersection is 120^0. If the radius of simple curve is to be introduced is 600m. Find the following,
    a. Tangent distances
    b. Chainage of the point of Commencement.
    c. Chainage of point of Tangency.
    d. Length of the Long Chord.
14. Two tangents intersect at a chainage of 1190m, the deflection angle being 36^0. Calculate the necessary data for setting out a curve with the radius of 300m by Rankines/Deflection angle method. The peg interval is 30m
15. Two straights meet at an apex angle 126^0 48'and are to be joined by a circular curve of 300m radius. Calculate the data necessary to setout the curve using a 30m chord by Rankines method.
16. Two straights BA & AC are intersected by a line EF. The angles BEF and EFC are 140^0 & 145^0 respectively. The radius of the first arc is 600m and that of the second arc is 400m. Find the chainage of the tangent points and point of Compound curvature. The chainage of intersection point A is 3415m.

Unit 5- Modern Surveying

Cognitive level –Remember

1. What is meant by Remote sensing and what are its basic Principles.
2. Explain briefly the Fundamental principles of GPS
3. What are GPS Receivers and List the advantages and disadvantages.
4. What is meant by GIS and list their objectives and applications.

Cognitive level –Understand

5. List the applications of Remote sensing.
6. Explain the working principle of GPS.
7. Explain the working principle of GPS navigator.
8. Compare GIS with Auto CAD.

Unit 6- Total Station.

Cognitive level –Remember
1. Explain the principles of Electronic Theodolite.
2. Explain the principles of EDM.
3. Write a short note on Electronic Theodolite and EDM.
4. What is a Total station? Explain the working principle of Total Station.
5. What is the function of prism reflectors in total station?
6. List the advantages of Total station.
7. Write a note on Prism.

Cognitive level –Understand
8. List the various application of total station

9. Mention any two total station characteristics.

10. List the component parts and functions of a Total Station.
11. What are the points should be kept in mind while using Total station during the operation of,
    a. Levelling
    b. Measuring distances
    c. Measuring angles.
    d. Contouring.
12. Mention any one Linking software used, to transfer data files in Total station.
13. Briefly write the field procedure for co-ordinate measurement, using Total station. What is electronic note book?

Cognitive level –Application
14. Explain the procedure of setting out Building corners by Total station.
15. Explain the procedure to mark control points and offset lines by total station.

Course Title: **CONSTRUCTION TECHNOLOGY**		
Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE34T**
Type of Course: **Lectures, Self Study & Student Activity**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks		SEE- 100 Marks

Prerequisites: Knowledge of science, Materials of Construction.

COURSE OBJECTIVES:

1. Understanding properties of soil, to know about concepts of load distribution and different types of foundation construction techniques.
2. Necessity, functions, suitability of building components and materials, construction techniques as per IS codes.
3. Exposure to dimensional aspects of openings, maintenance and repair works of building components and introduces preventive measures to be adopted in buildings located in areas prone to earth quake.

On successful completion of this course, the student will be able to

	Course Outcome	CL	Linked PO	Teaching Hrs
CO1	Identify the types of soils, to know the properties, strength of soils, to suggest suitable type of foundations and to overcome the difficulties during excavation.	R/U/Ap	1,2,3,4,5,7,8,10	11
CO2	Describe the concepts of masonry buildings and to know the defects in their construction process and maintenance methods.	U/Ap	1,2,5,6,7,10	10
CO3	Plan the various types of openings and building components.	R/U/Ap	1,2,5,10	06
CO4	Explain the different types of staircases, Roofs and Floors.	R/U/Ap	1,2,5,10	12
CO5	Illustrate the necessity of temporary works and finishes in building construction considering the safety aspects.	U/Ap	1,2,5,6,7,10	07
CO6	Analyze the failure of building components, apply the concepts of maintenance and repair works to fight with extreme weather conditions and focus on the earthquake resistant buildings.	R/U/Ap	1,2,4,5,6,7,8,10	06
CO7	Manage the suggested or identified constructional engineering problems, formulate and solve in teams, in order to improve future problem solving ability and able to present it.	R/U/Ap/C	1,2,3,4,5,6,7,8,9,10	*
			Total sessions	**52**

Legend- R; Remember U: Understand Ap: Application   Ay: Analysis   C:Creation   E: Evaluation
* Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Construction technology	3	3	1	2	3	3	3	2	-	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If >40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENTS

Course	COURSE CONTENTS	HOURS
1	**1. Soils and its Properties** 1. Types of soils and their suitability to construction of the structures. 2. Bearing Capacity and determination of safe bearing capacity of the soils by plate load test. 3. Method of improving the safe bearing capacity. 4. SBC Values for various types of Soils. **2. Foundations** 1. Definition and purpose of Foundation. 2. Shallow foundations: Spread footing, combined footing, Strap footings & Raft foundation. 3. Deep foundation: Pile foundations-End bearing piles, friction piles, Foundation in Black Cotton Soil. 4. Causes for failure of foundation and preventive measures. 5. Necessity of shoring and strutting in foundation excavation	11

		and process of dewatering.	
2		**3. Stone & Brick masonry** 1. Terms used in stone masonry and brick masonry 2. Coursed rubble masonry and Ashlar masonry. 3. Stone Cladding works for facing of walls. 4. List Bonds used in Brick masonry, Study of English bond & Flemish bond and their uses. 5. Construction of cavity walls. 6. Partition walls-bricks, Concrete block, Glass, Plywood, hard board and aluminium. **4. Dampness and Prevention of dampness** 1. Definition and causes of dampness 2. Effects of dampness and prevention of dampness 3. List the materials used for damp proof course.	10
3		**5. Lintels & Arches** 1. Necessity of lintels and arches, sunshades, sun breakers and canopy, portico. 2. RCC lintels, sun shades, sun breakers, plinth beams and grade beams. 3. Arch-Terms used, Types of arches-Flat, Segmental, and Semi-circular only. **6. Doors and Windows** 1. Definition of doors, windows and ventilator and their purpose 2. Standard size of doors, windows & ventilators for different types of building as per I.S codes. 3. Important types of doors, windows and ventilators in general use. 4. Fixtures for doors, windows and ventilators.	06
4		**Stairs** 1. Technical terms 2. Requirements of a good stair. 3. Classification of stairs, brief description & their suitability.	12

		4. Uses of Ramps, Escalators and lifts.	
		8.Floors	
		1. Definitions and types of floors.	
		2. Selection of flooring material	
		3. Laying of Ceramic tile flooring, Vitrified flooring, Marble flooring, Wooden flooring, Vinyl flooring and Cement concrete floorings.	
		9. Roof	
		1. Definition of roof and common types of roofs used in general.	
		2. Pitched roof- basic elements.	
		3. Steel trusses.	
		4. Common types of Roofing materials.	
		5. Flat RCC roof-advantages and disadvantages.	
		6. Weather proof course for flat roofs.	
5		**10. Scaffolding and Shoring** 1. Scaffolding-component parts of scaffolding, Types of scaffolding and props. 2. Use of Steel tube scaffolding 3. Types of shoring-Raking, Flying & Dead shores. **11. Plastering, Pointing and Painting** 1. Object of plastering and requirements of good plaster. 2. Method of cement plastering 3. Types of plaster finishes-Smooth, sand faced, rough cast, pebble dash, depter, scrapped, textured finish. 4. Method of pointing & types of pointing. 5. Methods of painting, distempering & varnishing on different surfaces.	07
6		**12. Ventilation systems** 1. Definition, Necessity & requirements of ventilation system 2. Types of ventilation **13. Earthquake Resistant Buildings** 1. List Earthquake zones in India. 2. Precautionary measures to be taken for buildings prone to	06

		earth quake.	
	14. Miscellaneous		
		1. Water proofing, structural glazing, bamboo as a construction material, precast composed panel, anti-termite treatment.	

SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Collect different types of soil samples and to identify the properties.
2. Study the load distribution from structural components to soil and prepare a report.
3. Collect and study different photographs of various foundations and prepare a report.
4. Prepare a case study on foundation failure.
5. Identify different types of masonry materials and study their properties
6. Collect and study different photographs of stairs and arches.
7. Collect different types of flooring materials and prepare a report.
8. Collect and study the different types of Damp Proofing materials and prepare a report.
9. To prepare models of various types of foundations.
10. To prepare models of different types of masonry arrangements.
11. To prepare models of different types of scaffolding.
12. To prepare models of different types of roofs trusses.
13. Prepare a chart of Earth quake zones of India.
14. Understand the classification of earth quake zones of India.
15. Plan suitable schedule of openings for building works.
16. Plan a Weather proofing work for a flat roof.
17. Visit any nearby material testing laboratory and prepare a report on various tests conducted on building materials.
18. Write a report on advanced construction techniques used in civil engineering.
19. Prepare a report on prefabricated construction.
20. Watch a video on anti-termite treatment and prepare a presentation on anti- termite treatment.
21. Visit any nearby construction site and write a report on various construction activities.
22. Prepare a report on the use of modern construction equipment's in construction.
23. Studies on the strength of stabilised mud block masonry and burnt brick masonry using cement soil quarry dust mortar
24. Comparison of risk assessments for underground construction projects
25. Study of copper tailing as a plastering material
26. A study on preparation of bricks using copper tailing waste
27. Report of sandwiched panel elements as a partitioning wall material
28. Load bearing capacity of unreinforced brick masonry vault
29. Enhancement of characteristic strength and durability of brick masonry
30. Report of brick and brick masonry strength for your district.
31. Size effect of masonry joint on compressive strength of stabilised mud blocks

32. Case report on building cracks and causes and its prevention
33. Some studies on the use of strength booster low cost additives in burnt brick manufacture
34. Experimental investigation on brick masonry domes
35. Stabilised copper tailing blocks
36. Low cost roofing tiles
37. Some studies on the strength behaviour of fly ash bricks
38. Report and manufacture of masonry blocks different machines with different materials
39. Size effect of masonry joint on compressive strength of stabilised mud blocks
40. Liqueconss floors and roofs
41. Strength analysis of cement stabilised soil blocks a case report
42. Low cost bricks making
43. Appropriate technology to manufacture common building burnt brick
44. Behaviour of masonry wall subjected to dynamic load
45. Development of b.c soil stabilised building blocks using lime and fly ash
46. A laboratory report on the utilisation of red mud in pavements and as building material
47. Fly ash mosaic flooring tiles
48. Analysis of hyperbolic paraboloid shell foundation
49. Characteristic report of BC soil of village
50. Flexural behaviour of gfrp wrapped masonry beams
51. Fly ash bricks
52. Bioclimatic building design in three climate zones in state
53. Earthquake resistant wooden house Design procedure for pile caps
54. Control Of Corrosion On Underwater Piles
55. Deep Foundations Case Histories
56. Design of Shallow Foundations
57. Analysis Of Stability Of existing Slopes
58. Development Of BC Soil Stabilised Building Blocks Using Lime And Flyash
59. DIAGRID
60. Soil Nailing

NOTE

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:

Unsatisfactory 1, Developing 2, Satisfactory 3, Good 4, Exemplary 5

2. Reports should be made available along with bluebooks to IA verification officer.

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2,** Satisfactory **3,** Good **4,** Exemplary5				
1.Organisation	2				
2.Fulfill team's roles & duties	3				
3.Conclusion	4				
4.Convensions	5				
Total	14				
Average=(Total /4)	3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

Course delivery: The course will be delivered through lectures, site visits, models and Power point presentations/ Videos.

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Thrice test (Average of three tests)	Test 1	20	Blue books	CO1, CO2
					Test 2			CO3, CO4
					Test 3			CO5, CO6
				Activities		05	Written Report	CO7
	SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course			Feedback forms	1 & 2 Delivery of course
	End of Course Survey			End of the course			Questionnaires	1,2,3, 4 & 5, 6 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Weightage of Marks and blue print of marks for SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE			Marks weightage	weightage (%)	A*	B*
			Cognitive Levels						
			R	U	Ap				
1	Soil and its Properties, Foundation	11	17% **5**	50% **15**	33% **10**	30	21	2	2
2	Stone & Brick masonry, Dampness and its Prevention	10	0% **0**	67% **20**	33% **10**	30	19	2	2
3	Lintels & Arches, Doors and Windows	6	33% **5**	33% **5**	33% **5**	15	12	1	1
4	Stairs , Floors, Roofs	12	14% **5**	71% **25**	14% **5**	35	23	1	3
5	Scaffolding and Shoring, Plastering, Pointing and Painting	7	0% **0**	75% **15**	25% **5**	20	13	2	1
6	Miscellaneous	6	33% **5**	33% **5**	33% **5**	15	12	1	1
	Total	52	14% **20**	59% **85**	28% **40**	145	100	9	10

Legend- R; Remember U: Understand   Ap: Application   Ay: Analysis   C:Creation   E: Evaluation
A*-SEE questions to be set for (05marks) in Part – A
B*- SEE questions to be set for (10marks) in Part – B

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	73
2	Applying the knowledge acquired from the course	28
3	Analysis	0
4	Synthesis (Creating new knowledge)	0
5	Evaluation	0

FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks		
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM		20		
	Year:				
Name of Course coordinator : CO's:____			Units:__		
Question no	Question		MARKS	CL	CO	PO
1						
2						
3						
4						

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QP FOR CIE

Test/Date and Time	Semester/year	Course/Course Code	Max Marks			
Ex: I test/ 6 th week of sem 10-11 Am	III SEM	CONSTRUCTION TECHNOLOGY	20			
	Year: 2015-16	Course code: 15CE34T				
Name of Course coordinator : Note: Answer all questions			Units:1,2 CO: 1,2			
Question			CL	CO	PO	
1	a) List the objectives of foundation? **OR** b) Explain with the help of sketch the Raft foundation.		R U	1	1,2	
2	a) Explain the determination of safe bearing capacity of soils by plate load test. **OR** b) What are the points to be observed while construction of brick masonry?		A U	1,2	1,2	
3	a) What are the effects of Dampness? **OR** b) Distinguish between Rubble stone masonry and Ashlar masonry.		A U	2	1,2	

📕**TEXT BOOKS & REFERENCES**

1. Building construction—B.C.Punmia; Ashok Kumar Jain; Arun Kumar Jain, Firewall Media, 2005

2. Building Construction- P.C.Varghese, PHI Learning Pvt. Ltd.2009

3. Building construction—S.C.Rangwala, Charotar Publishing House Pvt. Limited, 2009

4. Building construction and Materials —Gurucharan Singh, Jain Book Agency

5. Building construction—Sushil kumar, Standard Publishers Distributors Delhi, 2001

IS Codes

1. IS 2720: Methods of tests for soils.
2. IS 1904-(1986): Code of Practice for Design and Construction of Foundations in Soils: general requirements.
3. IS 1080-(1985): Code of Practice for Design And Construction of Shallow Foundations in Soils.
4. IS 2212-(1991): Code of practice for brick works.
5. IS 1597-1 &2(1992): Construction of Stone Masonry-Code of practice.
6. IS 4326 (1993) Code of practice for Earth quake resistant design of structures.
7. IS 1893-1 (2002) Criteria for Earth quake resistant design of structures

E –Learning

1. https://www.youtube.com/watch?v=rPlOd2qUcCI
2. https://www.youtube.com/watch?v=nMIl3krK-GI
3. https://www.youtube.com/watch?v=ob4oOtx9m40
4. https://www.youtube.com/watch?v=6mncKCIl8pI
5. https://www.youtube.com/watch?v=6OAHO9zgeXM
6. https://www.youtube.com/watch?v=C1byOuqC684
7. https://www.youtube.com/watch?v=j1bL_1NBvIc
8. https://www.youtube.com/watch?v=cQGDP8kWEMM
9. https://www.youtube.com/watch?v=NxNoH86WJjI
10. https://www.youtube.com/watch?v=rh1Z-i14-h0
11. https://www.youtube.com/watch?v=veF4uSUtrEY
12. https://www.youtube.com/watch?v=USat6LdENzU
13. https://www.youtube.com/watch?v=OYjEUXON8cY
14. http://www.nicee.org/EQTips.php

CONSTRUCTION TECHNOLOGY

TIME: 3 Hours   Max. Marks: 100

PART A

Answer any six questions out of nine. Each question carries 5 marks: (5x6=30)

1. What are the different methods of improving the bearing capacity of soils? Explain any three methods.
2. Briefly discuss the causes for failure of foundation.
3. Explain the following terms a) frog b) quoins c) jambs d) reveals e) copings
4. What are the causes of dampness in buildings? Explain any one method of preventing the dampness?
5. Sketch and label the various components of an arch.
6. Briefly explain the different types of fittings used in doors.
7. Enumerate the merits and demerits of concrete flooring.
8. Explain with a neat sketch a) closed couple roofs.
9. List the Earth quake zones of India.

PART B

Answer any seven questions from a set of ten questions each question carries 10 marks: - (10x7=70)

1. Explain the determination of safe bearing capacity of soils by plate load test.
2. Explain with a neat sketch. i) Combined footing ii) Raft foundation
3. a)Explain with neat sketch ashlar masonry.
   b)Explain the following; i) Glass partition, ii) Aluminium partition
4. a) Explain with a neat sketch English bond for 1½ brick thick wall.
   b) Define cavity wall. Explain the construction of cavity wall.
5. a)Explain with a neat sketch a) Bay window b) louvered windows,
   b) Distinguish between a spiral staircase and a helical stair case.
6. a)Draw a neat sketch of a dog legged staircase.
   b)Enumerate the merits and demerits of concrete flooring.
7. a) With a neat sketch explain Queen post roof truss.
   b) What are the advantages and disadvantages of flat roofs?
8. Explain with a neat sketch: i) Single or Brick layers scaffolding ii) Cantilever or Needle scaffolding.
9. Explain the procedure of painting of plastered walls with plastic emulsion paint.
10. a) What are the requirements of a good ventilation system?
    b) What are the advantages of pre-cast composed panels?

MODEL QUESTION BANK

Code: 15CE34T

Diploma in Environmental Engineering
III Semester
Course title: **CONSTRUCTION TECHNOLOGY**

CO 1: Identify the types of soils, to know the properties, strength of soils, to suggest suitable type of foundations and to overcome the difficulties during excavation.

REMEMBER LEVEL QUESTIONS
1. List out the different types of soil and which type of soil is most suitable for building construction.
2. Define bearing capacity of soil.
3. What are the requirements of a good foundation?

UNDERSTANDING LEVEL QUESTIONS

1. Explain the methods of improving the safe bearing capacity of soils?
4. Define foundation. Discuss various functions served by foundations.
5. What is the difference between a shallow foundation and a deep foundation?
6. Briefly explain the common types of shallow foundations with a neat sketch.
7. Explain with the help of sketches the following types of foundation
   a) Stepped footing b) Combined footing c) Raft foundation
   d) Pile foundation
8. Explain the situations in which pile foundation is preferred.
9. Classify the various types of piles based on i) function and ii) materials and composition.
10. What is the difference between end bearing pile and a friction pile?
11. What are the causes for failure of foundation?
12. Suggest the prime preventive measures to failure of foundation.
13. Under which circumstances the shoring is necessary.
14. Distinguish between the shoring and strutting in foundation.
15. Explain in brief the process of dewatering during excavation.

APPLICATION LEVEL QUESTIONS

1. Explain the determination of safe bearing capacity of soils by plate load test.

CO 2: Understand the concepts of masonry buildings and to know the defects in their construction process and maintenance methods.

UNDERSTANDING LEVEL QUESTIONS

1. Write short notes on i) header bond ii) stretcher bond iii) Dutch bond iv) garden wall bond
2. Define cavity wall. What are its advantages?
3. Define a partition wall. Enumerate various requirements to be fulfilled by a partition wall.
4. Differentiate between the following:
   a) Header and stretcher b) king closer and queen closer c) sill and lintel d) cornice and corbels
5. Explain the following terms a) frog b) quoins c) jambs d) reveals e) copings d) throating e) Freeze
6. How do you lay stone cladding work for facing of walls?

7. Differentiate between English bond and Flemish bond.
8. Explain with the help of sketches general features of a cavity wall.
9. Explain various causes of dampness in buildings.
10. What are ill effects of dampness in buildings?
11. Explain various methods of damp proofing?
12. What are the requirements of an ideal material for damp proofing?
13. List out the different materials used in damp proof course.

APPLICATION LEVEL QUESTIONS

14. Explain the following; a) Glass partition b) Aluminium partition c) plywood partition d) Hard board partition e) brick partition
15. Explain with a neat sketch English bond for 1½ brick thick wall.
16. Explain with a neat sketch Flemish bond for 1½ brick thick wall.
17. Explain with neat sketch coursed rubble masonry.
18. Explain with neat sketch ashlar masonry.

CO 3: Plan the various types of openings and building components.

REMEMBER LEVEL QUESTIONS

1. List the different types of windows used in general.
2. Define the following terms i) mullion ii) transom iii) reveal iv) style v) horn.
3. Classify the lintels based on the materials used.

UNDERSTANDING LEVEL QUESTIONS

4. What are lintels? Sketch a lintel and combined sunshade for an external doorway.
5. Explain briefly the RCC lintel with chejja.
6. Distinguish between Intrados and extrados.
7. Write short notes on a) spandrel of an arch b) flat arch c) segmental arch d) semi-circular arch
8. Distinguish between through lintel and cut lintels.
9. Write a note on i) sliding door ii) revolving door iii) collapsible door.

APPLICATION LEVEL QUESTIONS

1. Sketch and label the various components of an arch.
2. Explain with a neat sketch the following types of Windows i) Louvered window ii) bay window iii) lantern window iv) sky light
3. Explain with a neat sketch the following types of Doors i) Flush doors ii) Louvered doors.
4. Briefly explain the different types of fittings used in doors.
5. What are the functions of a ventilator? How it is different from a window.

CO 4: Understand the different types of staircases, Roofs and Floors.

REMEMBER LEVEL QUESTIONS

1. State briefly the requirements of a good stair case.

2. State the circumstances under which you use the following types of stairs i) Dog legged stair ii) open newel stair iii) half turn geometrical stair iv) spiral stair
3. List out the various special staircases.
4. Define Flooring. What are the different types of Floorings?
5. List the common types of roofing materials.

UNDERSTANDING LEVEL QUESTIONS

6. Explain the following terms i) Landing ii) Nosing iii) Winders iv) Stringer v) Newel vi) Hand rail
7. Distinguish between a spiral staircase and a helical stair case.
8. Indicate the situation where you would recommend a) ramp b) escalators
9. Write a short note on a) escalator b) lift
10. What are the types of lifts?
11. Enumerate the merits and demerits of concrete flooring.
12. What are the characteristics of a good flooring material?
13. Explain the following terms a) Pitch b) Eaves c) Gable d) Ridge e) Valley
14. Briefly explain the classification of roofs.
15. What are the advantages and disadvantages of flat roofs?

APPLICATION LEVEL QUESTIONS

1. Draw a neat sketch of a dog legged staircase.
2. Explain the method of laying of cement concrete flooring.
3. Explain the method of laying wooden flooring.
4. Explain the method of laying marble flooring.
5. Explain with a neat sketch a) Lean to Roofs b) Couple Roofs
6. Explain with a neat sketch a) Closed couple roofs b) Collar Roofs c) Purlin Roofs
7. With a neat sketch explain Queen post roof truss.
8. With a neat sketch explain King post roof truss
9. Explain the procedure for weather proofing of flat roofs.
10. Explain with a neat sketch any one type of steel trusses.

CO 5: Necessity of temporary works and finishes in building construction considering the safety aspects.

UNDERSTANDING LEVEL QUESTIONS

1. What do you understand by scaffolding? What are the essential requirements a good scaffolding?
2. Explain the terms a) Putlogs b) Braces c) Toe board d) Ledgers e) Standards
3. Explain steel tube scaffolding with a neat sketch.
4. What is the necessity of shoring? List the different methods of shoring.
5. What are the objectives of plastering and pointing?
6. What are the characteristics of good plastering materials?
7. List the tools used for plastering.
8. Briefly explain the method of cement plastering.

9. Briefly explain sand faced type of plaster finishing.
10. Briefly explain pebble dash type of plaster finishing.
11. Write a note on various defects in plastering.
12. List the different methods of pointing? Explain rubbed pointing.
13. What are the objects of painting?

APPLICATION LEVEL QUESTIONS

1. Explain with a neat sketch Single or Brick layers scaffolding.
2. Explain with a neat sketch cantilever or needle scaffolding.
3. Explain with a neat sketch double or masons scaffolding.
4. Explain with a neat sketch Raking type of shoring.
5. Explain with a neat sketch flying type of shoring.
6. Explain with a neat sketch dead type of shoring.
7. Explain briefly the procedure of painting of plastered walls with plastic emulsion paint.
8. Explain briefly the procedure of painting of new wood work with synthetic enamel paint.
9. Explain briefly the procedure of painting with dry distemper.
10. Briefly explain the method of polishing wood work using varnish.

CO 6: Analyze the failure of building components, apply the concepts of maintenance and repair works to fight with extreme weather conditions and focus on the earthquake resistant buildings.

REMEMBER LEVEL QUESTIONS
1. List the Earth quake zones of India.
2. Write a note on termites and their attack on buildings.
3. Write a short note on bamboo construction.

UNDERSTANDING LEVEL QUESTIONS

4. What are the reasons for providing ventilators in buildings?
5. What are the requirements of a good ventilation system?
6. Briefly explain the method of water proofing in buildings.
7. What is the meaning of structural glazing? Explain briefly.
8. What are the advantages of pre-cast composed panels.

APPLICATION LEVEL QUESTIONS

1. Explain how you reduce earth quake effects in important buildings.
2. Explain how preconstruction anti termite treatment is carried out.
3. Explain how post construction anti termite treatment is carried out.

	Course Title: **BUILDING PLANNING AND DRAWING**		
	Credits (L:T:P) **0:2:4**	Total Contact Hours: **78**	Course Code: **15CE35D**
	Type of Course: **Practical, Case study**	**Credit :03**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Pre-requisite: Basic knowledge of Engineering Drawing, ability to visualise 2D and 3D views.

Course objectives:

1. Know various building components, their need and location in a building.
2. Be aware of the influence of climatic parameters on buildings, orient the building accordingly and plan sustainable water supply and energy requirement of the building.
3. Use National Building Code and local bye laws, select and use the relevant bye law according to the geographical location of the building.
4. Be aware of principles of building planning and to draw plan, elevations and section of residential and public buildings showing maximum details.
5. Be able to prepare building services drawings such as staircases, lifts and fire escapes. Prepare electrical, water supply and sanitary layout for buildings.
6. Measure an existing building using both conventional and SI units, check for deviations from local bye laws, prepare a case study and suggest remedies with relevance to cost effective building technologies.

On successful completion of the course, the student should be able to attain the following Course Outcomes:

COURSE OUTCOMES		CL	Linked PO	Teaching Hrs
CO1	Apply the concepts of building planning considering climatic parameters, building bye laws, classification of buildings and design buildings.	R/U/A	1,2,5,6,7	9
CO2	Draw site plan, plans, elevations and sectional views of residential, commercial and public buildings, showing maximum details of various building components using the available construction area effectively according to codal provisions and standard units.	R/U/A/An	1 to 9	42
CO3	Prepare building services drawings.	R/U/A/An/C	1 to 9	18
CO4	Apply his knowledge to evaluate existing projects, suggest economical modifications for sustainable development and strengthen his professional skills through self-employability and lifelong learning.	R/U/A/An/C/E	1 to 10	9

Legend: R: Remember, U: Understand, A: Apply, An: Analyse, S: Synthesise, E:Evaluate

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and Practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
BUILDING PLANNJNG & DRAWING	3	3	3	3	3	3	3	3	3	1

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

Detailed Course Content

UNIT	COURSE CONTENT	HOURS ALLOTED
1	**Introduction** 1.1Building Planning- Factors Shape size and topography of site, Climatic conditions of the site, Functional requirements of the building, Local Bye laws- requirements of size of different components, setbacks, neighbourhood, Owner :– Status-Choices-Preferences, Economy 1.2 Building Planning- Principles Aspects, Prospects, roominess, furniture requirements, groupings, circulation, privacy, elegance, lighting & ventilation, sanitation, flexibility, economy, practical considerations. 1.3 Building Bye Laws Means of access, internal and external open spaces, floor area ratio, height of building, safety precautions. Building Sanction procedures- key plan (layout plan), site plan, building plan, working plan, validity of sanction, completion certificate.	9

UNIT	COURSE CONTENT	HOURS ALLOTED

2	**Site Plan &Planning of Buildings**
	2.1 Drawing of site plan showing setbacks, Floor Area Ratio, Height of Building, and Minimum Distance from Power line, as per National Building Code (NBC).
	2.2 Given the floor area or carpet areas of rooms, plan the building and draw a Single line diagram of building.
	    a) Residential building
	    b) School Buildings
	    c) Hostel Buildings
	    d) Primary Health Centre
	2.3 Draw the Plan, Elevation and Sectional views for the following types of buildings.
	    a) Residential buildings.
	    b) School Buildings
	    c) Hostel Buildings
	    d) Primary Health Centre
	    e) Canteen Building
	    f)Two storied residential building
	    g)Small work shop Building
		42

3	**Building Basic Services** 3.1 Preparation of water supply Layout for residential building. 3.2 Preparation of Electrical Layout for residential building. 3.3 Preparation of Sanitary Layout for residential building. 3.4 Preparation of Shallow Well Rain Water Harvesting Method for Building. 3.5 Preparation of Fire Fighting layout for buildings.	18
	Case study	09
	Total	**78**

Course Delivery:
- The course will be delivered using models and Videos

🎯 SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage. For every plan prepared calculate the Floor Area Ratio.

1. Prepare a case study of nearby small public buildings verify and draw the various views and judge the prevailing bye-laws.
2. Prepare a plan, elevation and section of a residential building with split floors and roofs (Split floors and roofs have different floor and roof levels).
3. Develop a plan of rain water harvesting, ground water recharge and solar harvesting for your institution/any other building.
4. Develop a plan of solar harvesting for your institution/any other building.
5. Prepare a plan of temporary construction shed and draw various views.
6. Prepare a plan of bus stand and draw various views.
7. Prepare a plan of cycle stand and draw various views.

8. Study the difference between framed structure and a load bearing structure and present it.
9. Incorporate the concepts of Green building technology in your institute building.
10. Draw the plan elevation and sectional views of a pitched roof residential building.
11. Draw the plan and sectional views of a soak pit and septic tank.
12. Study of economising the cost of openings in bulding
13. Roof rainwater harvesting - a case study

NOTE:

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:

(Unsatisfactory **1,** Developing **2,** Satisfactory **3, Good4,** Exemplary**5**)

2. Reports should be made available to IA verification officer.

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score				
	(Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good **4,**Exemplary5				
1.Literature	1				
2.Fulfill team's roles & duties	4				
3.Conclusion	3				
4.Convensions	5				
Total	13				
Average=(Total /4)	3.25=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relev ant info	Has included some relev ant info	Has included many relev ant info	Has included all relevant info needed
2.Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

📕 **TEXT BOOKS**

1. Building Planning and Drawing- S.S. Bhavikatti, M.V.Chitawadagi, I.K International Publishing House Pvt.Ltd
2. Civil Engineering Drawing and design – D.N.Ghose (CBS Publishers)
3. A text Book of Draughtsman Civil(Theory and Practical) – R.S. Mallik and G.S.Meo (Asian publishers, New Delhi)
4. Building Drawing – Shah,Kale and Patki(Tata McGraw Hill Publishers)
5. Civil Engineering Drawing – Gurucharan Singh
6. Building planning and drawing - Dr. N. Kumara Swamy and A. Kameswara Rao-Charotar Publishing House Pvt.Ltd
7. Civil Engineering Drawing and House Planning - B.P.Verma, Khanna Publishers

IS-CODE
1. IS 962: 1989- Code of Practice for Architectural and Building Drawings.
2. National Building Code of India 2005

COURSE CONTENT AND EVALUATION CHART FOR SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE						Marks weightage	weightage (%)	A*	B*	C*
			Cognitive Levels										
			R	U	Ap	Ay	C	E					
1	Introduction	9	25%	25%	25.00%	25.00%	0.00%	0.00%	16	12	8		
			4	4	4	4	0	0					
2	Site plan and planning of building	42	10%	35%	35.00%	10.00%	10.00%	0.00%	70	54		1	1
			6	25	25	7	7	0					
3	Building basic services	27	10.0%	10.0%	30.00%	20.00%	30.00%	0.00%	40	35			2
			4	4	12	8	12	0					
Total		78	15.0%	23%	30.0%	18%	13.3%	0.0%	126	100	8	1	3
			14	33	41	19	19	0					

A*-SEE QUESTIONS TO BE SET FOR (2 MARKS) in PART – A

(Answer5 out of 8 Questions, Answers to Part A should be written on drawing sheet only

B*- SEE QUESTIONS TO BE SET FOR (50MARKS) in PART – B (compulsory)

C*- SEE QUESTIONS TO BE SET FOR (20MARKS) in PART – C (any one)

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**38**
2	Applying the knowledge acquired from the course	**30**
3	Analysis	**18**
4	Synthesis (Creating new knowledge)	**14**
5	Evaluation	**0**

Course Assessment and Evaluation Chart:

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Graded Exercises	10	Drawing Sheets	1to 4
				Student activities Case Study	15	Report + Drawings	1 to 4
	SEE	End Exam		End of the course	100	Answer scripts at BTE	1 to 4
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	Delivery of course
	End of Course Survey			End of the course		Questionnaires	Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination
Note:
1. Rubrics to be devised appropriately by the concerned faculty to assess Case study / Student activities.

III Semester Diploma In Civil Engineering

PART-A (Compulsory)

Answer any five Questions (5 x 2 =10)

1. Define working plan.
2. What is the meaning of roominess and what is the desired value.
3. State various factors that influence building planning?
4. What is Floor Area Ratio?
5. At what level are ventilators provided in bathrooms and water closets? Why?
6. Expand NBC
7. What should be the floor to floor height for Residential and public building ?
8. Mention the minimum width of landing in residential building and public building ?

PART-B

9. The line diagram shown in the figure for a proposed Residential Building with clear dimensions between inside walls (All dimensions are in mm). Draw to a scale of 1:100 the following views

        a) Plan   20

        b) Section on AA   20

        c) Front Elevation   10

Foundation:Foundationshall be of C.C. 1:4:8 mix, 1000 wide and 300 thick laid at 1100 below G.L. for all mainwalls and verandah retaining wall. It consists of two footings of size 700 X 400 and 500 X 400 in C.M. 1:6

Basement:Thebasement will be in brick work in C.M. 1:5, 300 mm wide and 600 thick above G.L. A DampProof course in C. M. 1:3, 20 thick will be provided for all walls.

SuperStructure:Allmain walls will be in brick work in C.M. 1:5, 200 mm thick. The inner partition walls in toilet will be100 mm thick. The height of all the walls will be 3000 mm above floor level.

Roofing:The roofing will be R.C.C. 1:2:4 mix, 120 mm thick flat slab. Verandah slab will be of R.C.C. 1:2:4 mix, 100 thick at a height of 2600 mm from verandah floor level. A weathering course in brick jelly lime concrete plastered with mortar 1:5:9 mix, 75 mm thick will be provided.

Lintels:R.C.C. lintel 120 thick over all the openings shall be provided. Suitable sunshades for all external openings shall be provided.

Flooring:Theflooring will be in C.C. 1:4:8, 120 mm thick plastered smooth with C.M. 1:3, 20 mm thick for allthe portions.
Steps:Provide steps of rise 150mm and tread 250 mm
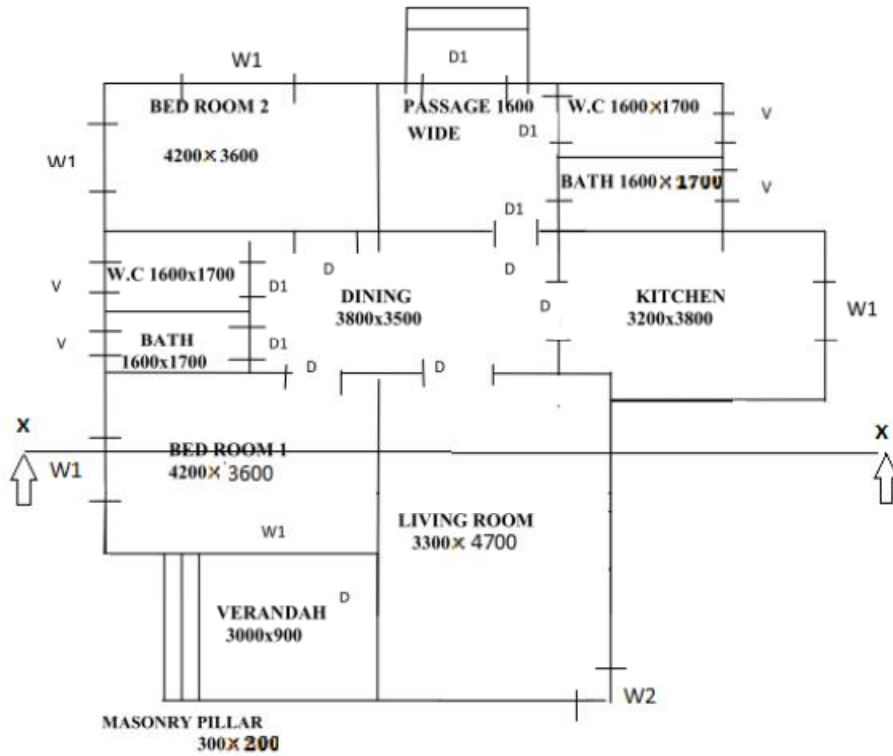
SCHEDULE OF OPENINGS		
D	FLUSH DOOR	1000 X 2100
D1	PANELLED DOOR	900 X 2100
W1	WINDOW GLAZED	1200 X1200
V	VENTILATOR	900X300
W2	CORNER WINDOW (GLAZED)	1000x1200

PART-C

10. Draw the site plan to a scale of 1:50 and prepare a single line diagram for a residential building providing suitable room dimensions.

Site No-   50

Site Dimension – 9 m x 12 m

Orientation-

        East – 30 m Road

        West - Site No 115

        North – Site No 51

        South- Site No 49

Building Coverage 75 %   20

11. Draw the water supply layout for the given line diagram of the building

            OR

Draw the plan of Shallow Well Rain Water Harvesting Method for the given line diagram of the Building.   20

MODEL QUESTION BANK

1. List the various factors to be considered for planning a residential building.
2. Why rectangular the shape of the room is preferred in buildings.
3. Mention the advantages of the site on the top of a hill or on the slope of a hill.
4. Mention the disadvantages of the site on the top of a hill.
5. What is the range of bearing capacity of the soil suitable for residential building?
6. What are the things to be avoided near the buildings?
7. What are the disadvantages of the building near to the sea shore?
8. Explain how the buildings are to be oriented in the following division of the India
   a) Hot arid region b) hot humid zone c) tropical hilly region
9. What is the minimum area required for the proper ventilation.
10. Why the colour of walls, roofs, doors and windows should be lighter.
11. What is the meaning of roominess and what is the desired value.
12. What is the aspect of a kitchen in Indian residential building?
13. Where the bedroom is to be located in a building?
14. What is meant by Circulation in a building? Give guidelines for suitable circulation in a building.
15. Briefly explain the methods of ensuring natural lighting and ventilation in a building site.
16. State various factors influencing building plan.
17. What are the objectives of the building byelaws?
18. What do you mean by the means of access for a building?
19. What should be the minimum front open space for a building where the width of street fronting the plot is 7.5m?
20. What should be the minimum front open space for a building having a fronting street width less than 7.5m?
21. What should be the minimum rear open space of the building?
22. For a detached building what should be the minimum open space recommended.
23. What should be the minimum open space prescribed for a building of a height 10m.
24. What is Floor Area Ratio?
25. What is the standard specified height of the plinth from the ground level?
26. What should be the minimum height of a parapet wall?
27. What should be the maximum height of a compound wall?
28. What is the minimum grade of concrete for RCC work?
29. What should be the minimum thickness of the load bearing wall?
30. What is the minimum thickness of a slab?
31. What is the minimum size of a concrete column? Also mention the number and size of the rebar's?
32. Why the windows or ventilators are provided at higher level in bathrooms and water closet?
33. What is the difference between the key plan and site plan?
34. What do you mean by a habitable room? What are its minimum standards?
35. What do you mean by hazardous building? Give an example.
36. What is the main factor to be considered while planning?
37. Specify the minimum dimension for a living room in residential building as per the NBC standards
38. Draw the single line diagram for the given site measurements and setbacks.

39. Draw the single line diagram for the given site measurements and percentage of built up area.

40. The line diagram shown in the figure for a proposed Residential Building with clear dimensions between inside walls. Draw to a scale of 1:50 the following views
   a) Plan   20
   b) Section on AA   20
   c) Front Elevation   10
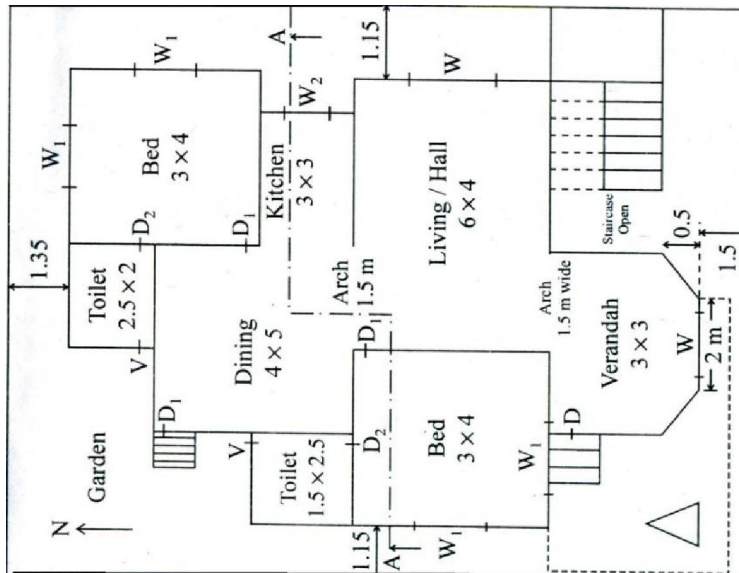
Construction details & Specifications are as follows

Foundation: 900mm wide & 1000mm deep with Concrete bed 1:4:8 200mm thick and two courses of size stone masonry in CM 1:8, 400mm depth of each course

Basement: Dressed size stone masonry in CM 1:6, 450mm wide 600mm depth includes 150mm PCC 1:3:6

Super structure:

BBM in CM 1:6 of 230mm thick for all walls

Sill 100mm thick of PCC 1:3:6

RCC Lintel 200mm thick of CC 1:2:4

RCC Chejja 600mm wide, 150mm thick at support and 50mm thick at end

RCC roof slab 150mm thick of CC 1:2:4 at 3000mm ceiling height

WPC 100mm thick average

Granite flooring 20mm thick over a CC 1:4:8 bed of 100mm thick

BBM in CM 1:6 Parapet wall of 150mm thick, 600mm height

Steps: Provide Suitable rise & tread

Schedule of Openings for Doors, Windows and Ventilators

Opening	Size
D	1100 x 2100 mm
D1	1000 x 2100 mm
D2	900 x 2100mm
W	1800 x 1200 mm
W1	1500 x 1200 mm
W2	1200x 750 mm
V	900 x 600 mm

39. Draw thewater supply/sanitary layout/ electrical layout for the given plan of the building.

40. Draw the plan of Shallow Well Rain Water Harvesting Method for the given plan of the Building.

	Course Title: **SURVEYING PRACTICE - II**		
	Credits (L:T:P) : **0:2:4**	Total Contact Hours: **78**	Course Code: 15CE36P
	Type of Course: **Practical's & Student Activity**	Credit :**03**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 50 Marks

Pre requisite: Knowledge of Surveying Practice – I & Surveying-II

Course Objective:

1. To provide knowledge of Total Station & advanced surveying instruments.
2. Develop skills in using Total Station & advanced surveying instruments and analyse data.
3. Develop skills to set out Curves in the field using both Total Station and Theodolite.
4. Develop skills to conduct traverse survey & to find the area

COURSE OUTCOMES :

On successful completion of this course student will be able to

	Course Outcome	**Experiments Linked**	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Use and operate Theodelite in the field.	1,2,3,4,5,6	U/Ap/E	1,2,3,4,8,9	21
CO2	Apply the knowledge of Theodolite in different operations in civil engineering projects.	7,8	U/Ap/E	1,2,3,4,8,9	06
CO3	Apply the knowledge of principles and purpose of Tacheometry in finding out the constants.	9,10,11	U/Ap	1,2,3,4,8,9	09
CO4	Formulate the setting out of curve by linear and angular methods.	12,13,14	U/Ap	1,2,3,4,8,9	09
CO5	Use total station in the fireld of civil engineering land survey.	15,16,17,18,19	U/Ap	1,2,3,4,5,8,9,10	27
CO6	Summarize the basic principles of GPS and GIS in civil engineering.	20,21,22	U/Ap	1,2,3,4,5,8,9,10	06
CO7	Manage the suggested or identified constructional problems, solve in teams, in order to improve future problem solving ability and able to present it.	Student activity	R/U/Ap/Ay/E/C	1,2,3,4,5,6,7,8,9,10	*
				Total sessions	**78**

Legend- R: Remember U: Understand Ap: Application Ay: Analysis C: Creation E: Evaluation
* Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
SURVEYING PRACTICE-II	3	3	3	3	3	1	1	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq$40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

GRADED EXERCISES		HOURS
1. Theodolite		
Experiment 1	Study of parts of a Transit Theodolite and its temporary adjustments	3
Experiment 2	Measurement of horizontal angle by Repetition method	3
Experiment 3	Measurement of horizontal angle by Reiteration method	3
Experiment 4	Measurement of vertical angle	3
Experiment 5	Open traversing using theodolite and plotting	3
Experiment 6	Conducting a Closed traverse of a given area and balancing it by a. Bowditch rule & b. Transit rule	6
2. Trigonometric Levelling		
Experiment 7	Determination of height of an object whose base is accessible	3
Experiment 8	Determination of height of an object whose base is inaccessible (single plane method instrument axes at different levels only-two cases)	3
3. Tachometric Surveying		
Experiment 9	Determination of Stadia constants	3
Experiment 10	Determine horizontal distance by Horizontal sight	3
Experiment 11	Determine Horizontal distance and elevation for inclined sight with staff held vertical by Stadia hair method	3
4. Curves		
Experiment 12	Setting out simple curve by Offsets from Long chord method	3
Experiment 13	Setting out simple curve by Rankines method using Theodolite	3

GRADED EXERCISES		HOURS
	and Total station	
Experiment 14	Setting out Compound curves given two Radii by Deflection angle method	3
5. Total Station		
Experiment 15	Total station-general commands used- instrument preparation and setting-reading distances and angles	6
Experiment 16	Measurement of distances and coordinates of given points, using a) EDM b)Total station	6
Experiment 17	Measurement of altitudes of given elevated points, using total station	3
Experiment 18	Run a closed traverse using Total station and plotting the traverse	6
Experiment 19	Determination of areas of field (enclosed three or more points) by total station	6
6. Global Positioning System		
Experiment 20	Study of hand held GPS	6
Experiment 21	Measurement of latitude, longitude and altitude using hand held GPS	
Experiment 22	Selection and marking of routes using hand held GPS	

Course Delivery: The course will be delivered through lectures, demonstration, site visits, expert lectures**.**

🎯 **SUGGESTED STUDENT ACTIVITY**

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Road survey (at least for 100m) by total station.

2. Conduct a traverse survey of a given plot and find out the area.

3. Prepare the contour maps of the given area in your locality.

4. Set out a center line of a given building using theodolite.

5. Find out the parameters of a curve for an existing road in your locality.

6. Locate a permanent structure using GPS in your locality and prepare a map.

7. Prepare a topographical map by using total station.

8. Detailed study report on telescope used in surveying instrument.

9. To set out two parallel lines along both the sides of an obstacle by using total station.

10. To find the distance between two inaccessible points by using total station.

11. Make a presentation on refraction error, curvature error caused by telescope.

12. Prepare a report on any one of the following. Arial survey, photogrammetric survey, hydrographic survey, military survey and mine survey.

NOTE

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:

Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary **5**

2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary 5				
1.Organisation	2				
2.Fulfill team's roles & duties	3				
3.Conclusion	4				
4.Convensions	5				
Total	14				
Average=(Total /4)	3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

Course Assessment and Evaluation Scheme

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Two test (average of Two tests)	10	Blue books	1,2,3,4,5,6
				Graded Exercise(Record)	10	Record	1,2,3,4,5,6
				Student activity	05	Report	CO7
	SEE	End Exam		End of the course	50	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1, 2 & 3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3, 4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note:
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Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**20**
2	Applying the knowledge acquired from the course	**50**
3	Analysis	**10**
4	Synthesis (Creating new knowledge)	**10**
5	Evaluation	**10**

TEXT BOOKS

1. Surveying and Levelling Vol- I & II by B C Punmia
2. Fundamentals of Surveying by S K Roy
3. Surveying and Levelling by T P Kanetkar & S V Kulkarni
4. Surveying and Levelling   by S S Bhavikatti vol 1 & 2
5. Surveying by Duggal
6. Surveying by R Agor
7. Surveying and Levelling by N N Basak
8. Advanced Surveying by R Agor

http://nptel.ac.in/video.php?subjectId=105104101
http://media.sakshat.ac.in/NPTEL-IIT-Videos/
http://nptel.iitk.ac.in/courses/Civil_Eng/IIT%20Roorkee/Surveying.htm
http://nptel.iitk.ac.in/
http://www.slideshare.net/Ehabtariq/surveying-by-using-digital-theodolite
http://www.tcd.ie/civileng/Staff/Brian.Caulfield/3A1/3A1%20Lecture%206.pdf
http://madinpoly.com/pdf/labmanual/1/surveying%20practical-ii%28317%29.pdf

SCHEME OF EVALUATION

SL NO	DESCRIPTION	MARKS
1	Writing procedure	05
2	Conducting & Performance	20
3	Calculation and results	15
4	Viva-voce	10
	Total	**50**

LIST OF EQUIPMENTS

SL NO	EQUIPMENTS	QUANTITY
1	THEODOLITE WITH 20" LC	10
2	EDM	06
3	TOTAL STATION	06
4	HAND HELD GPS NAVIGATOR	05
5	LEVELLING STAFF	10
6	PRISM AND PRISM POLE AND ELECTRONIC BOOK	06
7	LINKING SOFTWARE	02

VIVA QUESTIONS

Theodolite

1. Difference between a Transit Theodolite and a Dumpy level.
2. Difference between Swinging and Transiting.
3. Difference between Telescope normal and Telescope inverted.
4. Difference between Repetition method and Reiteration method.
5. What is meant by size of Theodolite.
6. What is the function of Levelling head and shifting head.
7. Define the term Changing face.
8. What are the uses of a Theodolite.
9. What are the fundamental lines of a Theodolite and how they are Related.
10. What are the errors in Theodolite work.

Theodolite traversing

1. What is meant by Theodolite traversing.
2. Difference between open traverse and closed traverse.
3. Difference between independent co-ordinates and consecutive co-ordinates.
4. Define the term Lattitude and Departure.
5. What is meant by Closing error and Balancing the Traverse.
6. Difference between Bowditch rule and Transit rule.
7. What are the Principles of a Closed traverse.
8. What is meant by Ommitted measurements.
9. Difference between Included angle and Deflection angle.

Trigonometric levelling.

1. What is meant by Trigonometrical levelling.
2. Under what circumstances Trignometrical levelling is adopted.
3. What is meant by single plane method.

Tacheometry

1. Explain the principle of Tacheometry.
2. Under what circumstances Tacheometric surveying is adopted.
3. List the advantages and disadvantages of Tacheometer.
4. What are Tacheometric constants and how to eliminate additive constant zero.
5. What is Annalatic lense and where it is used and what is its purpose.
6. How horizontal distances and elevations are determined by Stadia hair method.

Curves

1. Define the following terms
   a. Point of commencement.
   b. Point of tangency
   c. Length of Curve
   d. Length of long chord.
   e. Degree of curve.
2. What is the relation between degree of curve and radius of curve.
3. Under what circumstances the following curves are adopted.
   a. Simple Circular curve
   b. Compound curve.
   c. Reverse Curve
   d. Transition curve
   e. Valley curve
   f. Summit curve.
4. What are the precautions to be taken while introducing reverse curve.
5. What are the functions and objectives of transition Curve?
6. What are the importance of Curves?

Total Station.

1. What is a Total station.
2. What are the advantages of total station.
3. What are the applications of total station.
4. What is meant by Electronic Theodolite.
5. What are the principles of an electronic theodoloite.
6. What is the Brain of Total Station.

GPS & GIS

1. What is meant by Remote sensing and What are its basic Principles.
2. What are the applications of Remote sensing.
3. What are GPS receivers?
4. What is meant by GIS and what are its applications.
5. Compare GIS with Auto CAD.
6. What are the uses of GPS Navigators.

	Course Title: **BASIC COMPUTER AIDED DRAFTING IN CIVIL ENGINEERING**		
	Credits (L:T:P) : **0:2:4**	Total Contact Hours: **78**	Course Code: 15CE37P
	Type of Course: **Practical, Drawing, Student Activity**	Credit :**03**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 50 Marks

Pre-requisites: Basic computer Skills, Engineering Drawing.

Course Objective: To develop 2D civil engineering drawings of simple building elements and 3D drawings of simple objects.

Course Outcomes
At the end of the course, the students should be able to

	Course Outcome	**Experiments Linked**	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Interpret the basic concept and usage of CADD software. Compare the utilities of alternate drafting software from open source.	*1*	*R,U*	1,2,3,4,5,7,8,9	06
CO2	Setup CADD workstation and demonstrate basic commands of Computer Aided Design and Drafting Software.	*2*	*R,U,Ap*	1,2,3,4,5,7,8,10	09
CO3	Prepare and plot 2D drawings of Building Components.	*3,4,5,6,7,8*	*U,Ap*	1,2,3,4,5,7,8,9,10	18
CO4	Create and plot 2D objects.	*9,10*	*U,Ap*	1,2,3,4,5,7,8,10	33
CO5	Create and plot 3D objects.	*11,12*	*U,Ap*	1,2,3,4,5,7,8,10	12
CO6	Perform in teams and explore new ideas to interpret the existing models	*Suggested activity*	*U,A,C*	1,2,3,4,5,7,8,10	*
				Total sessions	**78**

Legend- R; Remember U: Understand Ap: Application Ay: Analysis C:Creation E: Evaluation
* **Related to Student activity beyond classroom hours.**

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Basic computer aided drafting in civil engineering	3	3	3	3	3	-	1	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If >40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

UNIT	MAJOR TOPICS	MARKS ALLOTTED
1. Introduction to CADD		
Experiment1	General features of CADD, CADD work station, Hardware and Software requirements, Advantages of using CADD, Starting CADD, Understanding CADD Editor Screen- title bar, menu bar, dashboard, standard tool bar, drawing area, UCS, command prompt area, status bar.	06
2. Demonstration of commands in CADD		
Experiment 2	Commands- Command Entry Options using -Command Line, Menus (File, Edit, View, Insert, Format, Tools, Draw, Dimension, Modify, Window, Help) and Dialog Boxes. Understanding the use of CADD Menus and Tool Bars, CADD Basic Entities- Drawing Line, Arc, Circle, Rectangle and polygons using different coordinate Systems such as Absolute Cartesian Coordinates, Relative Cartesian Coordinates, Absolute Polar coordinates, Relative Polar Coordinates, Direct distance entry and line command, Picking coordinates on the screen and line command.	09

UNIT	MAJOR TOPICS	MARKS ALLOTTED
3. Creating a new drawing		
	Using a wizard, using a template, starting from scratch. Selection of units, Selection of paper space, Setting up of limits Draw 2D drawings of simple building components and Print/ Plot the following drawings using Plot Settings.	
Experiment 3	Draw the Elevation and cross section of fully panelled Door	3
Experiment 4	Draw the Elevation and cross section of fully panelled Window and glazed Window	3
Experiment 5	Draw the Cross Section through Wall	3
Experiment 6	Draw the sectional Elevation of Spread footing	3
Experiment 7	Draw the sectional Elevation and Plan showing Reinforcement details of Column footing.	3
Experiment 8	Draw the plan and sectional Elevation of Dog-Legged Staircase.	3
4. Developing 2D drawings of Buildings		
Experiment 9	Draw Plan, Elevation and Sectional View of Single Room Building. Print/ Plot the above drawings using Plot Settings.	33
Experiment 10	Drawing Plan, Elevation and Sectional View of Two Room Residential Building. Print/ Plot the above drawings using Plot Settings.	
5. Developing Isometric and 3D drawings		
Experiment 11	Develop isometric drawings of Simple Objects such as Steps, Footings etc. Print/ Plot the above drawings using Plot Settings.	12
Experiment 12	Develop a 3D Model for a Single Room Building.	
	Total	**78**

SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Plot the different line styles used in Civil Engineering drawing.
2. Collect and measure the dimensions of different paper sizes available in market.
3. Prepare a plan, elevation and sectional view of a single room building and plot on different paper sizes.

4. Develop a 3D model of simple objects like cube, prism, cylinder and cone.
5. Measure the dimensions of a beam and column develop 3D model.
6. Measure the dimensions of your classroom/any other room and create a 3D model.
7. Prepare a plan showing arrangements of steps spiral stairs.
8. Develop a conic section
9. Object of drawing models non-dissected and dissected
          Rectangular prism, Rectangular pyramid,
          Triangular prism and pyramid, Square prism and pyramid,
          Pentagonal prism and pyramid, Hexagonal prism and pyramid ,
          Octagonal prism and pyramid, Decagonal prism and pyramid,
           Cube, cone sphere, cylinder, half cylinder, quarter cylinder,
          Semi, cylinder, tetrahedron, octahedron

NOTE

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:

Unsatisfactory 1, Developing 2, Satisfactory 3, Good 4, and Exemplary 5.

2. Reports should be made available along with bluebooks to IA verification officer.

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary**5**				
1.Organisation	4				
2.Fulfill team's roles & duties	3				
3.Conclusion	2				
4.Convensions	5				
Total	14				
Average=(Total /4)	14/4=3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Course Delivery: The course will be delivered through lectures and Demonstration and CAD practices**.**

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Twice test (average of two tests)	Test 1	10	Blue books	1,2,3
					Test 2			3,4,5
				Record		10	CAD exercises	1,2,3,4,5
				Student activity		05	Reports/ Presentations	1,2,3,4,5,6
	SEE	End Exam		End of the course		50	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course		---	Feedback forms	1,2,3,4,5,6 Delivery of course
	End of Course Survey			End of the course		---	Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

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Sl. No	Bloom's taxonomy	% in Weightage
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TEXT BOOKS

1. CAD in Civil Engineering a Laboratory Referrel- Dr M.A.Jayaram, D.S.Rajendra Prasad, Sapna Book House
2. Sham Tickoo-CADD: A Problem-Solving Approach Thomson LearningEMEA, Limited
3. George Omura- Mastering Auto CAD BPB Publication

4. Arshad N Siddique, Zahid Khab, Mukhtar Ahmed- Engineering Drawing withCADD

E-Learning:

http://www.sketchup.com
http://www.autodesk.in/products/3ds-max/overview
http://www.we-r-here.com/cad/tutorials/index.htm
http://www.cadtutor.net/tutorials/CADD/
http://www.caddprimer.com/CADD_training_tutorial/CADD_training_lessons.html
http://www.CADDmark.com/
http://www.CADDtutorials.net/

SCHEME OF END EXAMINATION

1	Record + viva on Suggested activity Report	05 +05 marks
2	Concept of CADD work station and Demo of commands	10 marks
3	Drawing and taking print out of given 2D problem	15 marks
4	Isometric drawing/3D drawings	15 marks
	Total	**50 marks**

Equipment List

1. Computers with Latest Configuration (One Computer per student in practical session).
2. Latest licensed Computer Aided Drafting Software.
3. Plotter of size A0
4. LCD Projector
5. UPS 5KVA

3ನೇ ಸೆಮಿಸ್ಟರ್ ಕನ್ನಡ–1 (ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಪರಿಚಯ)

3rd Semester	Course: Kannada Kali-1	Course Code:15KA3NT (2016-17)
	No. of Credits:02	No. of teaching hours/week:02 No. of teaching hours/Semester:26
	Mode of Assessment and Evaluation: Continuous Internal Evaluation (CIE)only. I.A Tests:30 Marks (3 Tests) Student activities: 20 Marks	Maximum Marks: 50 (CIE only) Minimum Passing marks:20 (IA Tests + Student activities)

ಉದ್ದೇಶ:

1. ಕೇಳುವುದು, ಗ್ರಹಿಸುವುದು, ನಿರರ್ಗಳವಾಗಿ ಮತ್ತು ಸ್ಪಷ್ಟವಾಗಿ ಓದುವ ಮತ್ತು ಮಾತನಾಡುವ (ಅಭಿವ್ಯಕ್ತಿಸುವ) ಸಾಮರ್ಥ್ಯವನ್ನು ಬೆಳೆಸುವುದು.
2. ಜ್ಞಾನಾರ್ಜನೆ, ಸಾಹಿತ್ಯಾಭಿರುಚಿ, ಚಿಂತನೆ ಮತ್ತು ಆನಂದಕ್ಕಾಗಿ ಸ್ವತಂತ್ರವಾಗಿ ಓದಲು, ಬರೆಯಲು ಮತ್ತು ಮಾತನಾಡಲು ಸಮರ್ಥರಾಗುವಂತೆ ಮಾಡುವುದು.
3. ಪದ ಸಂಪತ್ತನ್ನು ಹೆಚ್ಚಿಸಿಕೊಂಡು ಸ್ಪಷ್ಟ ಉಚ್ಚಾರಣೆಯೊಡನೆ ಲಿಖಿತ ಮತ್ತು ಮೌಖಿಕ ಚಟುವಟಿಕೆಗಳನ್ನು ಮಾಡಿಸಿ, ಸ್ವತಂತ್ರವಾಗಿ ಭಾಷೆಯ ಬಳಕೆ ಮಾಡುವುದು.
4. ನಾಡು–ನುಡಿ, ಸಂಸ್ಕೃತಿ ಮತ್ತು ಸಾಹಿತ್ಯಗಳ ಪರಿಚಯ ಮತ್ತು ಆತ್ಮೀಯ ಭಾವಾಭಿಮಾನವನ್ನು ಬೆಳೆಸುವುದು.
5. ಕ್ರಿಯಾತ್ಮಕ ಚಟುವಟಿಕೆಗಳಿಂದ ಭಾಷಾ ಕೌಶಲ್ಯದ ಸರಳ ಪ್ರಯೋಗ ಮಾಡಿಸುವುದು./ಕಲಿಸುವುದು. (ಕ್ರಿಯಾತ್ಮಕ ಚಟುವಟಿಕೆ ಎಂದರೆ, ವರ್ಣಮಾಲೆ ಪರಿಚಯ, ವ್ಯಾಕರಣದ ಸರಳ ಪರಿಚಯ, ಗುಣಿತಾಕ್ಷರ, ಸಂಯುಕ್ತಾಕ್ಷರಗಳು, ನಾಮಪದ, ಲಿಂಗ, ವಚನ, ಪ್ರತ್ಯಯಗಳು, ವಾಕ್ಯರಚನೆ (ಕರ್ತೃ, ಕರ್ಮ, ಕ್ರಿಯಾಪದ) ಇತ್ಯಾದಿ)

ಪಠ್ಯಕ್ರಮ ಮತ್ತು ಸರಳ ಭಾಷಾ ಕೌಶಲ್ಯ
(ಕನ್ನಡ ಕಲಿ–ಪಠ್ಯಪುಸ್ತಕ –ಶ್ರೀ ಲಿಂಗದೇವರು ಹಳೆಮನೆ – ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ ಪ್ರಕಾಶನ)
ಭಾಗ–1

ಪಾಠಗಳ ಕ್ರಮಾಂಕ Lesson No	ಪಠ್ಯವಸ್ತುವಿನ ವಿವರ – Curriculum Content	ಸೆಮೆಸ್ಟರ್ ಬೋಧನ ಆವಧಿ Total no.of Classes /Sem
	ಕನ್ನಡ ಭಾಷೆಯ ಪರಿಚಯ/ವರ್ಣಮಾಲೆ/'ಕನ್ನಡ ಕಲಿ'ಯುವ ವಿಧಾನ ಕುರಿತ ಮಾಹಿತಿ	**02**
1	Introducing each other Personal Pronouns, Possessive forms and Interrogative words 1. ನಾವು ಮತ್ತು ಭಾಷೆ 2. ಅಕ್ಷರಗಳಿಂದ ಪದಗಳು	03
2	Introducing each other Personal Pronouns, Possessive forms – Yes/No Type Interrogative	02
3	About Ramayana. Possessive forms of nouns, dubitive question, Relative nouns. ಪದಗಳಿಂದ ವಾಕ್ಯಗಳು	02
4	Enquiring about college. Qualitative and quantitative adjectives.	02
5	Enquiring about room. Predicative forms,	02

	locative case.	
6	Vegetable Market. Dative case, basic numerals.	02
7	About Medical college. Ordinal numerals, plural markers.	02
8	In a cloth shop. Color adjectives, defective verbs	02
9	Plan to go for picnic - imperative, permissive and hortative	02
10	Enquiring about one's family, Verb iru, and corresponding negation ಕನ್ನಡ ಚಿತ್ರಪಟಗಳಲ್ಲಿನ ಅಕ್ಷರಗಳನ್ನು ಗುರುತಿಸಿ ಓದಿ ದಿನಪತ್ರಿಕೆ ಓದುವ ಹವ್ಯಾಸ––ಸಂವಹನ ಮಾಧ್ಯಮದ ಬಗ್ಗೆ ಪರಿಚಯ	02
	ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆಗಳು	03
	ಒಟ್ಟು ಗಂಟೆಗಳು	26

ಸೂಚನೆಗಳು:

- ಈ ಪತ್ರದ ಮೂಲ ಉದ್ದೇಶ ಕನ್ನಡೇತರ ವಿದ್ಯಾರ್ಥಿಗಳು ಸರಳ ಕನ್ನಡ ಭಾಷೆಯಲ್ಲಿ ವ್ಯವಹರಿಸುವಂತೆ ಮಾಡುವುದಾಗಿದೆ. "ಕನ್ನಡ ಕಲಿ" ಪುಸ್ತಕದ ಮೇಲಿನ ಪಾಠಗಳ ಜೊತೆಗೆ "ಕ್ರಿಯಾತ್ಮಕ ಚಟುವಟಿಕೆ"ಯಿಂದ ಗಳಿಸುವ ಅಕ್ಷರ ಜ್ಞಾನದಿಂದ ಪದ ಸಂಪತ್ತು ಹೆಚ್ಚಿಸಿ, ಪದಗಳಿಂದ ಸ್ವಂತ ವಾಕ್ಯಗಳ ರಚನೆ ಮಾಡಿಸುವುದು. (ಅಮ್ಮ, ಮೊಬೈಲ್, ಕನ್ನಡ ಭಾಷೆ, ಕವಿಗಳು, ನಾಟಕ, ಜನಪದ ಕಲೆ, ನಾಡಿನ ಪ್ರಸಿದ್ಧ ವ್ಯಕ್ತಿಗಳು, ಸಹೋದರ, ಸ್ನೇಹಿತ, ತರಕಾರಿ, ದೋಸೆ, ತಿಂಡಿ, ನಿದ್ದೆ, ಬಿಸಿ, ಚಳಿ, ಆಕಾಶ, ಓದು, ಇತ್ಯಾದಿ ನಿತ್ಯ ಬಳಕೆಯ ಸರಳ ಪದಗಳಿಂದ ವಾಕ್ಯರಚನೆ ಮತ್ತು 25–50 ಪದಗಳ ಕಿರು ಲೇಖನ ರಚನೆ).

- ತರಗತಿ ಚಟುವಟಿಕೆಗಳ ಪುಸ್ತಕದಲ್ಲಿ (ಕ್ಲಾಸ್ ಅಸೈನ್ಮೆಂಟ್) ಕನ್ನಡ ವರ್ಣಮಾಲೆಯ ಸ್ವರ, ವ್ಯಂಜನಗಳ ಅಕ್ಷರಗಳ ಬರವಣಿಗೆ ಅಭ್ಯಾಸ, ವ್ಯಂಜನಗಳಿಗೆ ಸ್ವರಗಳನ್ನು ಸೇರಿಸುವಿಕೆ, ಅಕ್ಷರಗಳಿಂದ ಪದರಚನೆ, ಪದಗಳಿಗೆ ಪ್ರತ್ಯಯಗಳನ್ನು ಸೇರಿಸುವುದು(ಗೆ, ಯಿಂದ, ಅನ್ನು, ಅಲ್ಲಿ, ಗಳು, ಎಂದು…..ಇತ್ಯಾದಿ ಪತ್ರದಲ್ಲಿ ಬರುವ ಪದಗಳಿಗೆ ನಿತ್ಯ ಬಳಕೆಯ ಪ್ರತ್ಯಯಗಳನ್ನು ಸೇರಿಸುವುದು) ಪದಗಳಿಂದ ವಾಕ್ಯ ರಚನೆ. ಮಾಡುವುದು. ಮತ್ತು ಪಾಠ 1–10ರ ಪಠ್ಯಾಂತ್ಯದಲ್ಲಿ ಬರುವ ಅಭ್ಯಾಸಗಳಲ್ಲಿ ಆರಿಸಿದ ಅಭ್ಯಾಸ ಭಾಗಗಳನ್ನು ಬರೆಸುವುದು. ಮತ್ತು ಪಾಠ–20 ರ ಸ್ಕ್ರಿಪ್ಟ್– ಅನ್ನು ಆಧಾರವಾಗಿಟ್ಟುಕೊಂಡು ಅಭ್ಯಾಸ ಮಾಡಿಸುವುದು.

ಆಕರ ಗ್ರಂಥಗಳು:

1. ಕನ್ನಡ ಕಲಿ–ಶ್ರೀ ಲಿಂಗದೇವರು ಹಳೇಮನೆ – ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
2. ಪ್ರಾಥಮಿಕ ಶಾಲೆಯ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕಗಳು
3. ಸರಳ ಕನ್ನಡ ವ್ಯಾಕರಣ ಪುಸ್ತಕಗಳು– ಎಂ.ವಿ ನಾಗರಾಜರಾವ್/ಇತರೆ ಲೇಖಕರು.
4. ಪ್ರಯೋಗ ಪ್ರಣತಿ–ಪ್ರಥಮ ಪಿಯುಸಿ ಪೂರಕ ಪಠ್ಯ.
5. ಸರಳ ಪತ್ರವ್ಯವಹಾರದ ಪುಸ್ತಕಗಳು

ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯಮಾಪನ ವಿಧಾನ (3ನೇ ಸೆಮಿಸ್ಟರ್)

ನಿರಂತರ ಅಂತರಿಕ ಮೌಲ್ಯಮಾಪನ– Continuous Internal Evaluation (CIE) only.

ಕ್ರ.ಸಂ.	ಚಟುವಟಿಕೆಗಳು	ವಿವರ	ಗರಿಷ್ಠಾಂಕ	ಉತ್ತೀರ್ಣತೆಗೆ ಕನಿಷ್ಠಾಂಕ
01	ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ (I A Tests)	ಮೂರು ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆಗಳು (ಸರಾಸರಿ ಅಂಕಗಳನ್ನು ಪರಿಗಣಿಸುವುದು)	30	
02	ಕನ್ನಡ ಭಾಷಾ ಕೌಶಲ್ಯಾಭಿವೃದ್ಧಿ ಚಟುವಟಿಕೆಗಳು (Student Activities)	ಮೂರು ಚಟುವಟಿಕೆಗಳು (ಸರಾಸರಿ ಅಂಕಗಳನ್ನು ಪರಿಗಣಿಸುವುದು)	20	
		ಒಟ್ಟು ಅಂಕಗಳು	50	20

Course outcome:
 1. Developing listening and speaking skills.
 2. Easy Interaction with peers.
 3. Students can use the language at ease in daily life situations

ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆಗಳ ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳು:

ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆಗಳಿಗೆ ಈ ಕೆಳಗಿನ ಮಾದರಿಯಲ್ಲಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಸಿದ್ಧಪಡಿಸಿ ನಡೆಸುವುದು ಮತ್ತು "ಕನ್ನಡ ಕಲಿ" ಪಠ್ಯದ ಕಲಿಕೆ ವಿವರಣೆ (ಭಾಷಾಭ್ಯಾಸ) ಸಂಭಾಷಣಾ ಭಾಗಗಳು ಮತ್ತು ಅಂತ್ಯದಲ್ಲಿ ಅಭ್ಯಾಸ ಪುಸ್ತಕದಲ್ಲಿ ಬರುವ ಪ್ರಶ್ನೆಗಳ ವಿಧಾನವನ್ನು ಪರ್ಯಾಯವಾಗಿ ಬಳಸಿಕೊಂಡು ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳನ್ನು ತಯಾರಿಸಿಕೊಳ್ಳಬಹುದು.

ಡಿಪ್ಲೋಮಾ 3ನೇ ಸೆಮಿಸ್ಟರ್‌–ಕನ್ನಡ ಕಲಿ–1 (ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಪರಿಚಯ)

ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆ

ಸಮಯ: 60 ನಿಮಿಷಗಳು   ಅಂಕ: 30

‒‒‒

I.   Fill in the blanks using the appropriate words.(Any FOUR)   1X4=04
        i)   nimma raajya.......................?
        ii)   adu..............pustaka?
        iii)   avana .... hesaru suratkal injiniyaring kaaleju.
        iv)   ondu ruupaayige..............paise.
        v)   aval.ige hindustaani sanita tumba..................
        vi)   nanage ninna sahavaasa khanDitaa.................
        vii)   avanu nimma ....?

II.   Use the following words (any FOUR) in your own sentences.   1X4=04
     1.adhyaapaki 2.snehita 3. Vyaapaara 4.keTTa 5. Hasiru 6.angadi 7.taaja

III.   Answer the following questions (any FOUR)   1X4=04
        (a) nimma uuru yaavudu?
        (b) nivu diploma vidyaarthinaa?
        (c) nimma pennige estu ruupaaye?
        (d) nimma maatrubhaashe yaavudu?
        (e) nimage tingalige eshtu ruupaayi beeku?
        (f) nimma mane/ruumu elli ide?

IV.   Translate the following sentence in Kannada.   (any FOUR)   4X2=08
     1. Kannada is the language of Karnataka.
     2. My book is in my house.
     3. We have two houses in Bangalore.
     4. How much is this Pumpkin weighs?
     5. I want two packets of biscuits.
     6. How much do you pay rent for your room?
     7. What else do you want?

V.   ಕೆಳಗಿನವುಗಳನ್ನು ಹೊಂದಿಸಿ ಬರೆಯಿರಿ.   (Match the following)   1X4=04

1. ನೀವು ಯಾವಾಗ ಮನೆಯಲ್ಲಿ	1.ಇದೆ
2. ಪುಸ್ತಕ ಮೇಜಿನ ಮೇಲೆ	2.eldest son
3. Jaaga-ಜಾಗ	3.ಇತೀರಿ
4. Hiri maga	4.space

VI.   (1) Change into interragative using the underlined word. (Any Three)   1X3=03

1. Ivattu guruvaara.
2. evattu hattanee taariku
3. Aval hesaru liila.
4. Avara maatrabhaashe telagu alla.
5. Vavige ippttaydu ruupaayei beeku.
6. Adu maalatiya mane.

(2) change into Interrogate.   (Any THREE)   1X3=03

1.ಹೌದು, ಇದು ಪುಸ್ತಕ.
2. ಆಗಲಿ, ಹೋಗೋಣ.
3. ಈಗ ಒಂದೂವರೆ ಗಂಟೆ.
4. ಅವರು ಮನೆಗೆ ಬರುತ್ತಾರೆ.
5.ನಾವಿ ಮನೆಗೆ ಹೋಗೋಣ.
6. ಅವರು ಮನೆಗೆ ಹೋಗಲಿ.

ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ ರಚನಾ ಸಮಿತಿ

- **ಸಂಪಾದಕೀಯ ಸಮಿತಿ:**

1. ಶ್ರೀ ಟಿ ಎಲ್ ರವೀಂದ್ರ, ಉಪನ್ಯಾಸಕರು, ಸರ್ಕಾರಿ ಜಿ.ಆರ್.ಐ.ಸಿ.ಪಿ ಬೆಂಗಳೂರು.
2. ಶ್ರೀ ಟಿ. ತಿಮ್ಮಪ್ಪ, ಉಪನ್ಯಾಸಕರು(ಆಯ್ಕೆ ಶ್ರೇಣಿ), ಯಾಂತ್ರಿಕ ವಿಭಾಗ, ಸರ್ಕಾರಿ ಪಾಲಿಟೆಕ್ನಿಕ್, ತುಮಕೂರು.

- **ಸಲಹಾ ಸಮಿತಿಯ ಬಾಹ್ಯ ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳು.**

1. ಪ್ರೊ. (ಡಾ.) ಡಿ. ಪಾಂಡುರಂಗ ಬಾಬು, ಕುಲಸಚಿವರು, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
2. ಪ್ರೊ. (ಡಾ.) ಅಶೋಕ್ ಕುಮಾರ್ ರಂಜರೆ, ಪ್ರಾಧ್ಯಾಪಕರು, ಪ್ರಸಾರಾಂಗ ವಿಭಾಗ,
    ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
3. ಪ್ರೊ. (ಡಾ.) ಕೆ ವೈ ನಾರಾಯಣ ಸ್ವಾಮಿ, ಸಹ ಪ್ರಾಧ್ಯಾಪಕರು, ಸ್ನಾತಕೋತ್ತರ ವಿಭಾಗ,
    ಸರ್ಕಾರಿ ಕಲಾ ಕಾಲೇಜು, ಬೆಂಗಳೂರು.
4. ಪ್ರೊ. (ಡಾ.) ಜೆ ಬಾಲಕೃಷ್ಣ, ಪ್ರಾಧ್ಯಾಪಕರು ಹಾಗು ಮುಖ್ಯಸ್ಥರು, ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ವಿಭಾಗ,
    ಕೃಷಿ ವಿಶ್ವವಿದ್ಯಾಲಯ, (ಜಿಕೆವಿಕೆ) ಹೆಬ್ಬಾಳ, ಬೆಂಗಳೂರು.

KARNATAKA STATE BOARD OF TECHNICAL EXAMINATION, BENGALURU.													
TEACHING AND EXAMINATION SCHEME FOR KANNADA COURSE IN DIPLOMA PROGRAME													
SEMESTER: III				COMMON TO ALL DIPLOMA PROGRAMMES								C-15 Curriculum	
SL.N0	COURSE NAME	Teaching Department	COURSE /QP CODE	Teaching scheme					Examination scheme					
				Contact hours									
				TH	TU	PR	TOTAL	Credit	Exam paper duration in Hrs	End exam		Maximum CIE Marks (IA+SA)	Minimum Marks for passing. (IA + SA)
										Max marks	Min marks		
	THEORY												
1	KANNADA KALI-1	KA	15KA3NT	2	-	-	2	2	-	-	-	-	50	20
2	TANTRIKA KANNADA -1	KA	15KA3KT	2	-	-	2	2	-	-	-	-	50	20

CIE- Continuous Internal Examination: SEE-Semester End Examination: IA-Internal Assessment Tests: SA- Student Activity.

Note: 1. Candidates studied Kannada as one subject in 10th standard shall take Tantrika Kannada 1 &2. Others may take "Kannada Kali-1&2".

2. In 3rd Semester- Assessment is only by CIE and no SEE. Average marks of three I A tests shall be rounded off to the next higher digit. Rubrics to be devised appropriately to assess student activity.

KARNATAKA STATE BOARD OF TECHNICAL EXAMINATION, BENGALURU.													
TEACHING AND EXAMINATION SCHEME FOR KANNADA COURSE IN DIPLOMA PROGRAME													
SEMESTER: IV				COMMON TO ALL DIPLOMA PROGRAMMES								C-15 Curriculum	
SL.N0	COURSE NAME	Teaching Department	COURSE /QP CODE	Teaching scheme					Examination scheme					
				Contact hours									
				TH	TU	PR	TOTAL	Credit	Exam paper duration in Hrs	Sem End Exam		Maximum CIE Marks (IA+SA)	Minimum Marks for passing. (IA + SA)
										Max Exam Marks	Min Passing Marks		
	THEORY												
1	KANNADA KALI-2	KA	15KA4NT	2	-	-	2	2	2	50	20	-	-
2	TANTRIKA KANNADA -2	KA	15KA4KT	2	-	-	2	2	2	50	20	-	-

CIE- Continuous Internal Examination: SEE-Semester End Examination: IA-Internal Assessment Tests: SA- Student Activity.

Note: In 4th Semester- Assessment is only by SEE and no CIE. To award diploma certificate, passing in Kannada course is mandatory. However Kannada course is not included in the eligibility criteria for promotion to the higher semester.

3ನೇ ಸೆಮಿಸ್ಟರ್ – ತಾಂತ್ರಿಕ ಕನ್ನಡ –1 (ಸಾಹಿತ್ಯ ಮತ್ತು ಭಾಷಾ ಕೌಶಲ್ಯ ಪ್ರಯೋಗ)
ಪಠ್ಯಕ್ರಮ

3rd Semester	**Course:** ತಾಂತ್ರಿಕ ಕನ್ನಡ –1	**Course Code:15KA3KT** (2016-17)	
	No. of Credits:02	**No. of teaching hours/week:02** No. of teaching hours/Semester:26	
	Mode of Assessment and Evaluation: Continuous Internal Evaluation (CIE)only. I.A Tests:30 Marks (3 Tests) Student activities: 20 Marks	**Maximum Marks: 50 (CIE only) Minimum Passing marks:20** (IA Tests + Student activities)	

ಪಠ್ಯ ಪ್ರಕಾರ	ಪಾಠ	ಪಠ್ಯದ ಹೆಸರು/ಲೇಖಕರು/ಪ್ರಕಟಣೆ	ಸೆಮಿಸ್ಟರ್ ಬೋಧನಾವಧಿ ಗಂಟೆಗಳು
ಇತಿಹಾಸ	1	'ಸಂಸ್ಕೃತಿ'– ದೇ.ಜೆ.ಗೌ (ನಾಟ್ಯ ಸಂಸ್ಕೃತಿ–ದೇ.ಜೆ.ಗೌ)	02
ಸಂಸ್ಕೃತಿ	2	ನಮಗೆ ಬೇಕಾಗಿರುವ ಇಂಗ್ಲಿಷ್– ಕುವೆಂಪು	02
ಪರಿಸರ	3	ಆನೆ ಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು – ಬಿ ಜಿ ಎಲ್ ಸ್ವಾಮಿ	02
ಕ್ರೀಡೆ/ಜೀವನಕಲೆ	4	ಸೋಲೆಂಬುದು ಅಲ್ಪವಿರಾಮ – ನೇಮಿಚಂದ್ರ	02
ಯಶೋಗಾಥೆ/ವ್ಯಕ್ತಿಚಿತ್ರಣ	5	ಬದುಕನ್ನು ಪ್ರೀತಿಸಿದೆ ಸಂತ – ಎಚ್.ಆರ್.ರಾಮಕೃಷ್ಣ (ಕಲಾಂರ ವ್ಯಕ್ತಿ ಚಿತ್ರ)	02
ತಂತ್ರಜ್ಞಾನ	6	ಮಂಗಳನ ಅಂಗಳದಲ್ಲಿ – ಜೆ.ಬಾಲಕೃಷ್ಣ	02
ಭಾಷಾ ಕೌಶಲ್ಯ ಚಟುವಟಿಕೆಗಳು	7	*ಮೌಖಿಕ ಅಭಿವ್ಯಕ್ತಿ: ಸಹಜ ಭಾಷಾ ಬಳಕೆ: .ಆಶು ಭಾಷಣ> ವಿವಿಧ ರಚನಾತ್ಮಕ/ದೈನಂದಿನ ಬಳಕೆ ವಸ್ತು, ವ್ಯಕ್ತಿ, ಭಾವನೆಗಳ ಮೇಲೆ. ಒಂದು ಸಣ್ಣ ಏಕಾಂಕ (5–10 ನಿಮಿಷ) ನಾಟಕ. ಮಾದರಿ ಸಂದರ್ಶನ (ನೇಮಕಾತಿಗಾಗಿ ಸಂದರ್ಶನ)	06
ಲಿಖಿತ ಚಟುವಟಿಕೆಗಳು	8	ವಿಸ್ತರಣೆ: ನುಡಿಗಟ್ಟುಗಳು–ಪದಗಳನ್ನು ಬಳಸಿಕೊಂಡು ಸಣ್ಣ ವಾಕ್ಯಗಳ ರಚನೆ ಪರ್ಯಾಯ ಪದಗಳನ್ನು ಬರೆಯುವುದು(ಉದಾ: ಬಳಸು=ಉಪಯೋಗಿಸು, ಕಾಯು= ನಿರೀಕ್ಷಿಸು, ಚಿಂತಿಸು=ಯೋಚಿಸು, ಕೂಡಿಸುವಿಕೆ=ಸೇರಿಸುವಿಕೆ.......ಇತ್ಯಾದಿ)	06
		ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆಗಳು	02
		ಒಟ್ಟು ಗಂಟೆಗಳು	26

ತಾಂತ್ರಿಕ ಕನ್ನಡ–1

3ನೇ ಸೆಮಿಸ್ಟರ್ ಡಿಪ್ಲೋಮಾದ ಕನ್ನಡ ಪಠ್ಯ (ಕನ್ನಡ ಬಲ್ಲವರಿಗಾಗಿ)

1. ಪಠ್ಯರಚನಾ ಸಮಿತಿ
2. ನಿರ್ದೇಶಕರ ಮುನ್ನುಡಿ
3. ಪಠ್ಯ ರಚನಾ ಸಮಿತಿ ಮಾತುಗಳು
4. ಪಠ್ಯಕ್ರಮ

ಪರಿವಿಡಿ

<u>ಗದ್ಯ ವಿಹಾರ</u>

1. ನಾಟ್ಯ ಸಂಸ್ಕೃತಿ   (ಇತಿಹಾಸ)   – ದೆ.ಜೆ.ಗೌ
2. ನಮಗೆ ಬೇಕಾಗಿರುವ ಇಂಗ್ಲಿಷ್ (ಸಂಸ್ಕೃತಿ)   _ ಕುವೆಂಪು
3. ಸೋಲೆಂಬುದು ಅಲ್ಪವಿರಾಮ (ಕ್ರೀಡೆ/ಜೀವನಕಲೆ)   – ನೇಮಿಚಂದ್ರ
4. ಆನೆ ಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು (ಪರಿಸರ)   _ ಬಿ.ಜಿ.ಎಲ್.ಸ್ವಾಮಿ
5. ಬದುಕನ್ನು ಪ್ರೀತಿಸಿದ ಸಂತ (ಯಶೋಗಾಥೆ/ವ್ಯಕ್ತಿಚಿತ್ರಣ) – ಎಚ್.ಆರ್.ರಾಮಕೃಷ್ಣ
6. ಮಂಗಳನ ಅಂಗಳದಲ್ಲಿ.....   – ಡಾ:ಜೆ.ಬಾಲಕೃಷ್ಣ

<u>ಭಾಷಾ ಕೌಶಲ್ಯ–ಚಟುವಟಿಕೆಗಳು</u>

7. ಮೌಖಿಕ ಅಭಿವ್ಯಕ್ತಿ ಚಟುವಟಿಕೆಗಳು
8. ಲಿಖಿತ ಅಭಿವ್ಯಕ್ತಿ ಚಟುವಟಿಕೆಗಳು

Course outcome:
1. Developing listening and speaking skills.
2. Easy Interaction with peers.
3. Students can use the language at ease in daily life situations

ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯಮಾಪನ ವಿಧಾನ (3ನೇ ಸೆಮಿಸ್ಟರ್)

ನಿರಂತರ ಅಂತರಿಕ ಮೌಲ್ಯಮಾಪನ– Continuous Internal Evaluation (CIE) only.

ಕ್ರ.ಸಂ.	ಚಟುವಟಿಕೆಗಳು	ವಿವರ	ಗರಿಷ್ಠಾಂಕ	ಉತ್ತೀರ್ಣತೆಗೆ ಕನಿಷ್ಠಾಂಕ
01	ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ (I A Tests)	ಮೂರು ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ ಪರೀಕ್ಷೆಗಳು (ಸರಾಸರಿ ಅಂಕಗಳನ್ನು ಪರಿಗಣಿಸುವುದು)	30	
02	ಕನ್ನಡ ಭಾಷಾ ಕೌಶಲ್ಯಾಭಿವೃದ್ಧಿ ಚಟುವಟಿಕೆಗಳು (Student Activities)	ಮೂರು ಚಟುವಟಿಕೆಗಳು (ತಾಂತ್ರಿಕ ಪ್ರಬಂಧ/ಅಣುಭಾಷಣ/ಚರ್ಚೆ/ತಾಂತ್ರಿಕ ಕ್ಷೇತ್ರಗಳಲ್ಲಿನ ಅವಿಷ್ಕಾರಗಳ ಬಗ್ಗೆ ವಿಶ್ಲೇಷಣೆ ಇತ್ಯಾದಿ.) (ಸರಾಸರಿ ಅಂಕಗಳನ್ನು ಪರಿಗಣಿಸುವುದು)	20	
		ಒಟ್ಟು ಅಂಕಗಳು	50	20

ಸೂಚನೆ:

ಭಾಷಾ ಚಟುವಟಿಕೆಗಳಿಗಾಗಿ   ತರಗತಿ ಚಟುವಟಿಕೆಗಳ ಪುಸ್ತಕದಲ್ಲಿ   (ತರಗತಿಯ ಪ್ರಗತಿಪರ ಮೌಲ್ಯಮಾಪನ). ಗಾದೆಗಳ ವಿಸ್ತರಣೆ, ನುಡಿಗಟ್ಟುಗಳು, ಸಂಭಾಷಣೆ ಮಾದರಿಗಳು ಮತ್ತು ಪಠ್ಯದ ಸಾಹಿತ್ಯ ಭಾಗದ ಪಾಠಗಳ ಮೇಲೆ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರ– ಟಿಪ್ಪಣಿ ಮತ್ತು ಶಬ್ದಾರ್ಥದಲ್ಲಿ ಬರುವ ಪದಗಳಿಂದ ವಾಕ್ಯ ರಚನೆ ಮಾಡಿಸುವುದು.

- ### ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ

3ನೇ ಸೆಮಿಸ್ಟರ್– ತಾಂತ್ರಿಕ ಕನ್ನಡ–1 (ಕನ್ನಡಬಲ್ಲ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ)

ಸಮಯ: 1.00 ಗಂಟೆ   ಅಂಕಗಳು:30

ಸೂಚನೆ: ಕೆಳಗಿನ ಪ್ರಶ್ನೆಗಳಿಗೆ ಸೂಚನೆಗಳ ಪ್ರಕಾರ ವ್ಯಾಕರಣದೋಷವಿಲ್ಲದಂತೆ ಉತ್ತರಿಸಿ.
****
1. ಈ ಕೆಳಗಿನ 04 ಪ್ರಶ್ನೆಗಳಿಗೆ ಒಂದು ಪೂರ್ಣ ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿ.   1*4=04

(ಅ) ನಾಟ್ಯ ಯಾವಾಗ ಹುಟ್ಟಿಕೊಂಡಿತು?

(ಆ) ಆನೆ ಹಳ್ಳದ ಕಾಡಿನಲ್ಲಿ ನಾಪತ್ತೆಯಾದ ಹುಡುಗಿಯರ ಹೆಸರುಗಳನ್ನು ತಿಳಿಸಿ.

(ಇ) ರಾಷ್ಟ್ರಪತಿಯಾಗಿ ಆಯ್ಕೆಯಾದಾಗ ಕಲಾಂ ಅವರು ಮೊದಲು ಹೇಳಿದ ಮಾತುಗಳೇನು?

(ಈ) ಮಂಗಳನ ಅಂಗಳ ತಲುಪಿದ ಮೊದಲ ಅಂತರಿಕ್ಷ ನೌಕೆ ಯಾವುದು?

(ಉ) 'ಹಗಲುಗನಸು' ನುಡಿಗಟ್ಟನ್ನು ಬಳಸಿ ಸ್ವಂತ ವಾಕ್ಯವನ್ನು ರಚಿಸಿ.

(ಊ) 'ಸಿಹಿಕಹಿ' ಜೋಡುಪದವನ್ನು ಒಂದು ವಾಕ್ಯದಲ್ಲಿ ಬಳಸಿ.

2. ಕೆಳಗಿನ ಯಾವುದೇ ನಾಲು ಪ್ರಶ್ನೆಗಳಿಗೆ ಕನಿಷ್ಟ ಐದಾರು ವಾಕ್ಯಗಳಲ್ಲಿ ಉತ್ತರಿಸಿ.   4*4=16

(1) ಕುವೆಂಪು ಅವರು ಇಂಗ್ಲಿಷ್ ಕಲಿಯುವವರನ್ನು ಎಷ್ಟು ವಿಭಾಗವಾಗಿ ಹೇಗೆ ವಿಂಗಡಿಸಿದ್ದಾರೆ?

(2) ಕಲಾಂ ಅವರ ಯಶಸ್ಸಿನ ಮಂತ್ರಗಳೇನು?

(3) ಗಾದೆಗಳ ಮಹತ್ವವೇನು? ನಿಮಗೆ ಗೊತ್ತಿರುವ ಯಾವುದೇ ಎರಡು ಗಾದೆಗಳನ್ನು ಹೆಸರಿಸಿ.

(4) ಸಂವಹನ ಸಂದರ್ಭದಲ್ಲಿ ಬಳಸುವ ಭಾಷೆ ಹೇಗಿರಬೇಕು?

(5) ನೇಮಿಚಂದ್ರರ 'ಸಾವಿನತ್ತ ಒಂದು ಹೆಜ್ಜೆ ' ಕತೆ ಓದಿದ ಹುಡುಗಿ ತನ್ನ ಸೋಲಿನಿಂದ ಹೊರಗೆ ಬಂದದ್ದು ಹೇಗೆ?

(6) ಸಂದರ್ಶನ ಎಂದರೇನು? ವಿವರಿಸಿ.

3. ಯಾವುದೆ ಎರಡು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.   2*5=10

(1) ನಾಟ್ಯಕಲೆಯಲ್ಲಿ ಯಕ್ಷಗಾನ ಕಲೆ ಪ್ರಮುಖವಾದುದು. ಇದರ ಹುಟ್ಟು ಮತ್ತು ವ್ಯಾಪ್ತಿ ಬಗ್ಗೆ ತಿಳಿಸಿ.

(2) ಮಂಗಳಯಾನದ ಮುಖ್ಯ ಉದ್ದೇಶಗಳೇನು?

(3) 'ಮಾನವೀಯ ಮೌಲ್ಯಗಳು', ಅಂತರಜಾಲ – ಎರಡರಲ್ಲಿ ಒಂದಕ್ಕೆ ಸುಮಾರು ಒಂದು ಪುಟದಷ್ಟು
ಪ್ರಬಂಧ   ಬರೆಯಿರಿ.

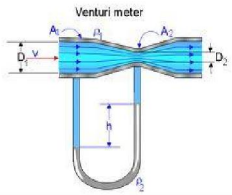(4) ಉದ್ಯೋಗದ ಸಂದರ್ಶನಕ್ಕೆ ಹೋಗುವಾಗ ಮಾಡಿಕೊಳ್ಳಬೇಕಾದ ಪೂರ್ವಸಿದ್ಧತೆಗಳೇನು?.

ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ ರಚನಾ ಹಾಗು ಪಠ್ಯಪುಸ್ತಕ ಸಮಿತಿ

- ### ಸಂಪಾದಕೀಯ ಸಮಿತಿ:

1. ಶ್ರೀ ಟಿ ಎಲ್ ರವೀಂದ್ರ, ಉಪನ್ಯಾಸಕರು, ಸರ್ಕಾರಿ ಜಿ.ಆರ್.ಐ.ಸಿ.ಪಿ ಬೆಂಗಳೂರು.

2. ಶ್ರೀ ಟಿ. ತಿಮ್ಮಪ್ಪ, ಉಪನ್ಯಾಸಕರು(ಆಯ್ಕೆ ಶ್ರೇಣಿ), ಯಾಂತ್ರಿಕ ವಿಭಾಗ, ಸರ್ಕಾರಿ ಪಾಲಿಟೆಕ್ನಿಕ್, ತುಮಕೂರು.

- **ಸಲಹಾ ಸಮಿತಿಯ ಬಾಹ್ಯ ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳು.**

1. ಪ್ರೊ. (ಡಾ.) ಡಿ. ಪಾಂಡುರಂಗ ಬಾಬು, ಕುಲಸಚಿವರು, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
2. ಪ್ರೊ. (ಡಾ.) ಅಶೋಕ್ ಕುಮಾರ್ ರಂಜರೆ, ಪ್ರಾಧ್ಯಾಪಕರು, ಪ್ರಸಾರಾಂಗ ವಿಭಾಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
3. ಪ್ರೊ. (ಡಾ.) ಕೆ ವೈ ನಾರಾಯಣ ಸ್ವಾಮಿ, ಸಹ ಪ್ರಾಧ್ಯಾಪಕರು, ಸ್ನಾತಕೋತ್ತರ ವಿಭಾಗ, ಸರ್ಕಾರಿ ಕಲಾ ಕಾಲೇಜು, ಬೆಂಗಳೂರು.
4. ಪ್ರೊ. (ಡಾ.) ಜೆ ಬಾಲಕೃಷ್ಣ, ಪ್ರಾಧ್ಯಾಪಕರು ಹಾಗು ಮುಖ್ಯಸ್ಥರು, ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ವಿಭಾಗ, ಕೃಷಿ ವಿಶ್ವವಿದ್ಯಾಲಯ, (ಜಿಕೆವಿಕೆ) ಹೆಬ್ಬಾಳ, ಬೆಂಗಳೂರು.

Course Title: HYDRAULICS			
Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**		Course Code: **15CE41T**
Type of Course Delivery: **Lectures and Student activity**	**Credit :4**		Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

(***(Common to all Civil/Civil (Draughtsman/Environmental/Public Health Engineering/Water Technology and Health Sciences Programme)***

Prerequisites: **Engineering Mathematics and Applied Science**

Course Objectives

1. Understand the principles and properties of fluid under static and dynamic state.
2. Measurement and computation of discharge of water.
3. Introduction to hydraulic machines.

At the end of the course the students should be able to

	Course Outcome	CL	Linked PO	Teaching Hrs
CO1	Define the terminology related to fluid properties, pressure and its measurements and compute forces on immersed vertical plane surfaces.	*R/U/Ap*	1,2,3,4,5,6	**10**
CO2	Apply the hydraulic principles in solving problems on discharge and pressure measurements using flow measuring devices. To analyse the forces and its head.	*R/U/Ap*	1,2,3,4,5,6	**10**
CO3	Determine the discharge and coefficients of discharge for Notches, Orifices and Weirs.	*R/U/Ap*	1,2,3,4,5,6	**13**
CO4	Verify the flow parameters related to pipes to measure the various losses of head through pipes.	*R/U/Ap*	1,2,3,4,5,6	**07**
C05	Analyse the flow parameters related to channels and to design most economical channel sections and also to measure the discharge.	*R/U/Ap*	1,2,3,4,5,6	**08**
C06	Summarize the principles of pumps and Turbines.	*R/U*	1,2,3,4,5,6	**04**

CIVIL

C07	Manage the suggested or identified problems on hydraulics and solve in teams, in order to improve future problem solving ability and able to present it.	R/U/Ap/Ay/C	1 to 10	*
		Total sessions		**52**

Legend- R: Remember   U: Understand   Ap: Application   Ay: Analysis   C: Creation   E: Evaluation
* Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
	Basic knowledge	Discipline knowledge	Experiments and Practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Hydraulics	3	3	3	3	3	3	1	1	1	1

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq$40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENTS

UNITS	CONTENT	HOURS
1	**FLUIDS, PRESSURE & ITS MEASUREMENTS AND HYDROSTATICS** **Fluid**-definition, types and properties (simple problems). **Pressure and its measurements**-Definition of fluid pressure, intensity of pressure and pressure head, Pascal's law, atmospheric pressure, gauge pressure, absolute pressure, vacuum pressure and their relations, Measurement of pressure: Piezometer, Manometer, differential manometer, (simple problems). **Hydrostatics**-Total pressure and centre of pressure on vertical planes like, triangular , rectangular and circular plane surfaces (simple problems).	10
2	**FLOW OF FLUIDS** Definition of discharge, Types of flow and their comparison, uniform and non-uniform flow, steady and unsteady flow, stream line and turbulent flow, rotational and irrotational flow, compressible and incompressible flow. Continuity equation- simple problems. Energies in fluid motion and their heads- Potential, Kinetic and Pressure head Bernoulli's theorem (without proof), assumptions and its limitations–simple problems. Horizontal venturimeter, theory and simple problems.	10
3	**FLOW THROUGH ORIFICES, NOTCHES AND WEIRS.** Definition, types of orifices, vena contracta, hydraulic co-efficient and their relationship (simple problems), Flow through only circular orifice (simple problems without derivation), Definition and types of mouthpiece (only theory). Definition of notch, and its types, discharge calculation for rectangular, triangular and trapezoidal notch (simple problems without derivation). Definition of weir, types, discharge over rectangular and cippolitte weir (simple problems without derivation)	13
4	**FLOW THROUGH PIPES** Loss of fluid friction, Types of losses-major and minor losses, Darcy's and Chezy's formula for head loss due to friction (simple problems). Hydraulic gradient and Total Energy Line. Flow through single pipe, Flow from one reservoir to another reservoir through single pipe, (simple problems). Water hammer, surge tanks (only theory).	07
5	**FLOW THROUGH CHANNELS** Definition and classification of channels. Discharge through channels using Chezy's and Manning's formula (no derivation – simple problems only). Most economical sections for rectangular and trapezoidal channels (simple problems).	08
6	**PUMPS AND TURBINES** Working principle of Reciprocating and centrifugal pumps (Only Theory) Turbine, types and its working principle of Pelton and Francis turbine (Only Theory)	04
	Total	52

Course Delivery: The course will be delivered through lectures and Power point presentations/ Video.

 SUGGESTED ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.
1. Prepare/Download a dynamic animation to illustrate the following:
2. Working principle of hydraulic pumps.

3. Working of different types of hydraulic devices (applications).
4. Download the catalogue of Hydraulic devices.
5. Arrange visit to nearby Hydraulic equipment based industries.
6. To visit an industry and submit a report on pressure measuring devices.
7. To prepare a report on pressure measuring devices available in market with its specifications
8. To carryout market survey for pipes of different sizes and materials available.
9. To visit & submit a report on nearby canal/irrigation structures/dam site to know the usage of notches and weirs.
10. To assess conditions of water supply mains of your locality and quantify the damages and remedial measures to be taken.
11. Types of pumps available in market and its uses.
12. Hydrological aspects of drought in your district
13. Hydrological aspects of small hydels in western ghats
14. Hydrological status of a few tanks in and around district a study using gis and remote sensing
15. Proposed mini hydel project near by your locality
16. Hydraulic floor crane, hydraulic four wheel jack, hydro power, hydraulic car lift, water wheel, hydraulic regenerative braking system

NOTE:

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:
Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good   **4**, Exemplary **5.**

2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary5				
1.Literature	3				
2.Fulfill team's roles & duties	2				
3.Conclusion	4				
4.Convensions	5				
Total	14				
Average=(Total /4)	3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Thrice test (Average of three tests)	Test 1	20	Blue books	CO1, CO2
					Test 2			CO3, CO4
					Test 3			CO5, CO6
				Student Activities		05	Written Report	CO7
	SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course			Feedback forms	1,2 & 3 Delivery of course
	End of Course Survey			End of the course			Questionnaires	1,2,3, 4,5, 6, 7 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   *SEE – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

1	Remembering and Understanding	48% weightage
2	Applying the knowledge acquired from the course	52% weightage
3	Analysis	0% weightage
4	Evaluation	0% weightage
5	Creating new knowledge	0% weightage

Weightage of Marks and blue print of marks for SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE Cognitive Levels			Marks weightage	weightage (%)	A*	B*
			R	U	Ap				
1	Fluids, pressure & its measurements and hydrostatics	10	16.66% **5**	33.33% **10**	50.00% **15**	30	19	2	2
2	Flow of fluids	10	16.66% **5**	16.66% **5**	66.66% **20**	30	19	2	2
3	Flow through orifices, notches and weirs	13	13.00% **5**	28.57% **10**	57.14% **20**	35	25	1	3
4	Flow through pipes	7	25.00% **5**	25.00% **5**	50.00% **10**	20	13	2	1
5	Flow through channels	8	25.00% **5**	25.00% **5**	50.00% **10**	20	15	2	1
6	Pumps and turbines	4	50.00% **5**	50.00% **5**	0.00% **0**	10	8	0	1
	Total	52	**20.9%** **30**	**27.6%** **40**	**51.7%** **75**	145	100	9	10

Legend- R; Remember   U: Understand   Ap: Application   Ay: Analysis   C: Creation   E: Evaluation
A*-SEE questions to be set for (05 marks) in Part – A
B*- SEE questions to be set for (10 marks) in Part – B

FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM		20
	Year:		
Name of Course coordinator : CO's:____			Units:__

Question no	Question	MARKS	CL	CO	PO
1					
2					
3					
4					

Note: Internal Choice may be given in each CO at the same cognitive level (CL).

Model Question Paper for CIE :

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th week of sem 10-11 Am	IV SEM	Hydraulics	20
	Year: 2015-16	Course code:15CE41T	

Name of Course coordinator :			Course Outcome : 1,2		

Note: Answer all questions

	Question	M	CL	CO	PO
1	1. State the different principles of measurement of pressure.	3	R	1	1,2,3
2	2. Differentiate between specific weight and specific gravity of an oil.	4	U	1	1,2,3
3	3. Define Bernoulli's theorem.	2	R	2	1,2,3,4
4	4. State the difference between uniform flow and non-uniform flow & steady and unsteady flow	4	U	2	1 to 6
5	a) A simple Manometer containing mercury is used to measure the pressure of water flowing in a pipe line. The mercury level in the open tube is 60mm higher than that in the left tube. If the height of water in the left tube is 500mm, determine the pressure in the pipe in terms of head of water. **OR** b) Water is flowing through a pipe of 100mm diameter with an average velocity of 10m/s. Determine the rate of discharge of the water in litres/salsa determine the velocity of water at the other end of the pipe, if the diameter of the pipe is gradually changed to 200mm.	7	A	1 ,2	1 to 6

 TEXT BOOKS

1. Hydraulics and Fluid Mechanics - Dr. P.N.Modi and DrS.M.Seth
2. Hydraulics and Fluid Mechanics - Dr. JagadishLal
3. Hydraulics and Fluid Mechanics - Abdulla Sheriff
4. Hydraulics and Hydraulic Machinery V. Thanikachelam T.T.T.I Madras - 600 113
5. Hydraulics, Fluid Mechanics and Fluid Machines - S.Ramamrutham.
6. Hydraulics, Fluid Mechanics and Fluid Machines Bansal A R.
7. Hydraulics, Fluid Mechanics and Hydraulic Machines R S Khurmi

Model Question Paper
Diploma in Civil Engineering
4TH semester
Course title: **HYDRAULICS**

Time: 3Hrs.   **Max. marks : 100**

Part –A
Answer any six questions each carries 5 marks

1. Distinguish between gauge pressure and absolute pressure.
2. What is Manometer? Explain differential manometer with a neat sketch.
3. Draw a neat sketch of Venturimeter and name the parts.
4. State the limitations of Bernoulli's theorem.

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5. Define Hydraulic coefficients and give the relation between them.
6. List different major and minor losses in pipe flow.
7. What is water hammer?
8. Define most economical section & state the conditions for a rectangular channel.
9. Explain the term open channel & list the various types of open channels.

Part –B
Answer any seven each question carries 10 marks

1. a) Define Pressure head and Total Pressure.
   b) A rectangular tank 3mx4m in size contain water upto a depth of 2.5m. Calculate the total pressure on the base of the tank and also intensity of pressure at the base of the tank.

2. The right limb of a simple U-tube manometer containing mercury is open to the atmosphere, while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 120mm below the level of mercury in the right limb. Find the pressure of fluid in the pipe, if the difference of mercury level in the two limbs is 200mm.

3. a) State a Bernoulli's theorem.
   b) A pipe 300m long has a slope of 1 in 100 and tapers from 1.0m diameter at the higher end to 0.50m at the lower end. The quantity of water flowing is 900lit/sec. If the pressure at the higher end is 70KPa, find the pressure at the lower end.

4. A venturimeter with a 150mm diameter at inlet and 100mm at throat is laid with its axis horizontal and is used for measuring the flow of oil specific gravity 0.9. The oil mercury differential monometer shows a gauge difference of 200mm. Assume coefficient of the meter as 0.98. Calculate the discharge in litres per minute.

5. a) What is an orifice? Mention its different types.
   b) A jet of water issues from an orifice of diameter 20mm under a head of 1m.What is the 'Cd' for the orifice, if actual discharge is 0.85lit/sec?

6. a) List the advantages of a triangular notch over a rectangular notch.
   b) During an experiment in a laboratory, 280lit of water flowing over a right angled triangular notch was collected in one minute. If the head of water over the sill is 100mm, calculate the 'Cd' of the notch.

7. a) Differentiate between a notch and a weir.
   b) A Trapezoidal notch of 1.2m wide at top and 0.45m at bottom is 0.3m high. Find the discharge through notch if head over notch is 225mm.Take C_d=0.6

8. a) State Darcy's equation for determination of loss of head due to friction in pipe.
   b) A reservoir has been built 4km away from a new extension area having 5000 population. Water is to be supplied from the reservoir to the new extension area. It is estimated that each person will consume 200litres of water per day, and that half of the daily supply is pumped within 10hours.Calculate the size of the supply main, if the loss of head due to friction in the pipeline is 20m.Take co-efficient of friction for the pipe line is 0.008

9. a) Define most economical channel section.
   b) Calculate the bed slope of trapezoidal channel of bed width 9m,depth of flow 1.2m and side slope 2H to 1V if the discharge is 8 m^3/s and Chezy's constant C=50.

CIVIL

10. a) With a neat sketch explain the main parts of a Reciprocating pump.
   b) Write any five differences between impulse turbine and reaction turbine.

MODEL QUESTION BANK

CO I : Fluids, pressure & its measurements and hydrostatics

Cognitive level –Remember

1. What is meant by pressure head? Derive an expression for it.
2. State the different principles of measurement of pressure.
3. Define the density of a liquid.
4. Define atmospheric pressure, gauge pressure, absolute pressure.
5. What is Manometer? Mention types of manometer.
6. State the difference between simple and differential manometer.
7. Define total pressure, centre pressure.

Cognitive level -Understand

8. Distinguish between gauge pressure and absolute pressure
9. Differentiate between specific weight and specific gravity of an oil.
10. Distinguish between compressibility and capillarity of water.
11. What do you understand by the term intensity of pressure? State its units.

Cognitive level -Application

12. A simple Manometer containing mercury is used to measure the pressure of water flowing in a pipe line. The mercury level in the open tube is 60mm higher than that in the left tube. If the height of water in the left tube is 500mm, determine the pressure in the pipe in terms of head of water.
13. A differential Manometer connected at the two points A and B at the same level in a pipe containing an oil of specific gravity 0.85, shows a difference in mercury level as 150mm.Determine the difference in pressure at the two points, the level of mercury in the left limb is lower than that in the right limb.
14. Determine the total & centre of pressure on an isosceles triangular plate of base 4m and altitude 4m, when it is immersed vertically in an oil of Sp.Gr. 0.9.The base of the plate coincides with the free surface of oil.
15. Find the intensity of pressure on diver working, at a depth of 200m under the sea, if the specific gravity of sea water is 1.025.

CO II : Apply the hydraulic principles in solving problems on discharge and pressure measurements using flow measuring devices.

Cognitive level –Remember

1. Define Bernoulli's theorem.
2. Give the equation for continuity of flow.
3. State the limitations of Bernoulli's theorem.
4. 4.Draw a neat sketch of Ventuimeter and name the parts.

5. What is Venturimeter?

Cognitive level -Understand

6. State the difference between uniform flow and non uniform flow & steady and unsteady flow.

Cognitive level -Application

7. A circular pipe of 250mm diameter carries an oil of specific gravity 0.8 at the rate of 120lit/sec and under a pressure of 20kpa.Calculate the total energy in meters at point which is 3m above datum line.
8. Water is flowing through a pipe of 100mm diameter with an average velocity of 10m/s. Determine the rate of discharge of the water in litres/salsa determine the velocity of water at the other end of the pipe, if the diameter of the pipe is gradually changed to 200mm.
9. A venturimeter with a 150mm diameter at inlet and 100mm at throat is laid with its axis horizontal and is used for measuring the flow of oil specific gravity 0.9. The oil mercury differential monometer shows a gauge difference of 200mm.Assume coefficient of the meter as 0.98. Calculate the discharge in litres per minute.
10. A pipe 300m long has a slope of 1 in 100 and tapers from 1m at the higher end to 0.5m at the lower end. Discharge through pipe is 5400litre per minute, if pressure at the higher end is 70KN/m^2, find the pressure at the lower end.

CO III : Understand and able to determine the discharge and coefficients of discharge for Notches, Orifices and Weirs.

Cognitive level –Remember

1. Define veena contracta.
2. What is an orifice? Give the classification.
3. Define Hydraulic coefficients and give the relation between them.
4. List the types of notches.
5. List the advantages of a triangular notch over a rectangular notch.

Cognitive level -Understand

6. Differentiate between a notch and a weir.
7. What is a cipplottei weir? How does it differ from a rectangular weir?

Cognitive level -Application

8. A right angled V-notch was used to measure the discharge of a pump if the depth of water over the notch is 200mm,calculate the discharge if C_d=0.62.
9. A Trapezoidal notch of 1.2m wide at top and 0.45m at bottom is 0.3m high. Find the discharge through notch if head over notch is 225mm.Take C_d=0.6.
10. A weir, 8m long is to be built across a rectangular channel to discharge a flow of 9m^3/sec. If the maximum depth of water on the upstream side of the weir is limited to 2mts maximum, what must be the height of the weir? Take C_d=0.62.
11. A jet of water issues from an orifice of diameter 20mm under a head of 1m.What is the 'Cd' for the orifice, if actual discharge is 0.85lit/sec?

CIVIL

CO IV : Analyze the flow parameters related to pipes to measure the various losses of head through pipes.

Cognitive level –Remember

1. List the types of losses in the pipe flow.
2. Give the Darcy's formula for head loss due to friction.
3. What is water hammer?
4. What is hydraulic mean depth?

Cognitive level -Understand

5. Explain Hydraulic gradient line & Total energy line with neat sketch.
6. Explain the surge tank with sketch.

Cognitive level -Application

7. A town having a population of 100000 is to be supplied with water from a reservoir at 5km distance. It is stipulated that one half of the daily supply 150lts/head should be delivered within 8. Hour that must be the size of the pipe to furnish the supply, if head available is 12m and C=45.

CO V : Analyze the flow parameters related to channels and to design most economical channel sections and also to measure the discharge.

Cognitive level –Remember

1. Give the Chezy's formula and Manning's formula.
2. State the conditions of the most economical section of a rectangular and Trapezoidal channel.

Cognitive level –Understand

3. Explain the term open channel & list the various types of open channels.

Cognitive level -Application

4. A rectangular channel has a cross section of $50m^2$. Determine the discharge through the most economical section, if bed slope is 1 in 1000 take Chezy's constant C=52.5.

CO VI : Understand the principles of pumps and Turbines

Cognitive level –Remember

1. What are the different types of pumps?
2. What is a turbine?
3. How turbines are classified?

Cognitive level -Understand

4. Explain the working principle of a centrifugal pump with sketch.
5. Explain the working principle of a reciprocating pump with sketch.

	Course Title: **SANITARY ENGINEERING**		
	Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE42T**
	Type of Course: **Lectures, Self Study & Student activities**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Prerequisites: Basic knowledge of environmental science, mathematics.

Course Objectives: It aims at enabling the student to understand the urban and rural sanitation.
1. Understand the need of sewage treatment and disposal of a city/town.

Course Outcomes: (CO's)

On successful completion of this course, the student will be able to

Course Outcome		CL	Linked PO	Teaching Hrs
CO1	Explain the concept of waste, types of sewage, sewerage system and appurtenances. Estimate the quantity of sewage of a town/city.	*R/U/A*	1,2,3,5,6,8	**06**
CO2	Analyse the Sewage samples using standard test procedures and understand the sewerage systems	*U/A*	1,2,3,4,5,6,10	**08**
CO3	Compute the quantity of storm water flow in different types of surface drains and appurtenances.	*U/A*	2,4,5,6,10	**10**
CO4	Compare various methods of Sewage treatment and sewage/sludge disposal methods.	*U/A*	2,3,5,6,7,9,,10	**14**
CO5	Demonstrate the arrangement of sanitary fittings in a building.	*U/A*	2,4,5,6,8	**06**
CO6	Identify the sources, effects and preventive measures of air and noise pollution.	*U/A*	1, 2,5,6,7,10	**08**
CO7	Suggested activity	*R/U/A/C*	1 to 10	*
		Total sessions		**52**

Legend- R; Remember U: Understand Ap: Application Ay: Analysis C:Creation E:Evaluvation
***Related to Student activity beyond classroom hours.**

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and Practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
WASTE WATER ENGINEERING	3	3	3	3	3	3	2	2	1	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If >40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

UNIT	COURSE CONTENT	HOURS ALLOTTED
1	**INTRODUCTION:** Definition of sullage, sewage, sewerage, sewer, refuge, garbage. Aims and objectives of sewerage work, systems of refuge disposal and water carriage system. **QUANTITY OF SEWAGE:** Domestic and industrial sewage, volume of domestic sewage, variability of flow, limiting velocities-Self cleansing and Maximum velocities of sewer. Simple problems on design of sewers.	06
2	**CHARACTERISTICS AND ANALYSIS OF SEWAGE:** Strength of Sewage, Sampling of Sewage to analyze for Physical, Chemical and Biological Parameters. Decomposition of sewage. Analysis of Sewage - Significance of the following Tests for i) Solids ii) Dissolved Oxygen iii) B.O.D iv) C.O.D v) pH value vi) Chlorides vii) Nitrate **SEWARAGE SYSTEMS:** Types of Sewerage System and their Suitability - Separate, Combined and Partially Separate Systems Brief Description and Suitability of the following Types of Sewers Stoneware, Cast Iron, Cement Concrete, AC Pipes, Pre-Cast Sewers, PVC sewer (SWR grade), and laying of sewers	08
3	**SURFACE AND STORM WATER DRAINAGE:** Determination of Storm Water Flow, Run-Off Co-Efficient, Time of Concentration, Empirical Formulae for Run-Off Simple Problems on Design of Storm Water Sewers Ssystems. Surface Drains - Requirements, Shapes, Laying and Construction. (No Design) **SEWERAGE APPURTENANCES:** Brief description, Location, Function and Construction of Manholes, Drop Manholes, Inlets Catch Basin, Traps, Flushing Tanks, Regulators.	10

4	**SEWAGE TREATMENT AND DISPOSAL :** **Preliminary Treatment** - Brief Description and Functions of - i) Screens ii) Skimming Tanks iii) Grit Chambers. **Primary Treatment** - Brief Description and Function of the Sedimentation and Septic Tanks **Secondary Treatment** - Brief Description of i) Trickling Filters ii) Activated Sludge Process Oxidation Ponds, Oxidation Ditches, Aerobic Lagoons, Anaerobic Lagoons, Rotary Biological Disc. **Tertiary treatment** – Activated sand filter and chlorination. **Sewage Disposal**- Dilution, Self purification of streams, factors affecting self purification. Disposal in Sea water, Disposal on Lands,. Recycle of wastewater(Grey water technology) **Sludge treatment & Disposal -** Sludge treatment & disposal methods. Sludge digestion tank, Sludge drying bed.	14
5	**SANITATION IN BUILDINGS AND SANITARY FITTINGS** Importance and Requirement of Building Drainage, General Lay-out of Sanitary Fittings and House Drainage Arrangements for Single and Multi- Storied Buildings as Per B.I.S Code of Practice. Dual pipe system. Sanitary Fittings- Water Closets, Flushing Cisterns, Urinals, Inspection Chambers, Traps, Anti-syphonage. Inspection, Testing and Maintenance of sanitary fittings.	6
6	**AIR AND NOISE POLLUTION: Air Pollution** –Definition, Causes and Classification of Air Pollutants. Effects of Pollution on Human Beings. Acid rain, Green house effect & Global warming, Ozone depletion. Prevention and control of Air Pollution, Cyclone Separator and ESP) **Noise**- Definition, Sources and measurement of noise, Effect of noise on human life and its control, Ambient air quality standards in respect of Noise, Legislations with respect to Air and Noise pollution. **Environmental impact assessment:** Aims &objectives of EIA Methodology of EIA, Environmental Impact statement (EIS).	8

Course Delivery: The course will be delivered through lectures and Power point presentations/ Video

 SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance the student's knowledge, practical skill, lifelong learning, communication, and modern tool usage.
1. Estimate total quantities of sewage generated from a locality and design the sewage discharge.
2. Visit nearby New layout under construction and collect details of sewerage system.
3. Visit Sewage Treatment Plant and collect details each unit operations for treatment of sewage and prepare the charts.
4. Visit nearby Certified Waste Water testing laboratories and identify various tests conducted on waste water.

5. For a given building identify various components of sanitary fixtures used for sewerage system.
6. To visit a nearby industry to collect details of sources and control of air pollution.
7. Prepare a mini project report for Sewerage System for a locality.
8. To conduct market survey of sanitary ware.
9. Visit any Industry and collect & study EIA report.
10. Prepare a report on Eco-toilets.
11. Prepare a report on Modern septic tanks using biogas.
12. study of municipal sludge as a building material
13. A study on solid waste management in your city
14. Performance studies of oxidation ponds
15. Conservation by waste water reclamation
16. A study on performance of existing treatment plant of diary waste and improvement of treatment units
17. Treatment and reuse of automobile service station wastewater for vegetation
18. Laboratory study of migration of contaminants through soil column
19. Solid waste management for your town
20. A study on handling collection and utilization of city refuse
21. Characterizing analysis of textile mill effluent and its impact on receiving bodies
22. Solid waste management- a case study of a city
23. Impact of industrial solid wastes on soil and sub-surface water
24. Effects due to untreated disposal of municipal sewage
25. Quality study of sewage in your district
26. Treatability studies of dairy effluent using anaerobic filter
27. Soil-industrial effluent interaction and their engineering behaviour
28. Study of heavy metals in river
29. Treatment of sugar waste using anaerobic filter
30. Analysis of performance of the existing sewage treatment plant at hospital
31. Medical waste management.
32. Solid waste management of city municipality
33. Evaluation of treatment plant efficiency using toxicity index-a case study of textile industries
34. Electronics waste management (computer & its accessories) for in city
35. Identification and investigation of solid waste dumping site

NOTE:
1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows: (Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good4**,** Exemplary**5**)
2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**,Exemplary5				
1.Literature	1				
2.Fulfill team's roles & duties	4				
3.Conclusion	3				
4.Convensions	5				
Total	13				
Average=(Total /4)	3.25=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relev ant info	Has included some relev ant info	Has included many relev ant info	Has included all relevant info needed
2.Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Thrice test (Average of three tests)	Test 1	20	Blue books	CO1,CO2
					Test 2			CO3,CO4
					Test 3			CO5, CO6
				Student Activities		05	Written Report	CO7
	SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course			Feedback forms	1 & 2 Delivery of course
	End of Course Survey			End of the course			Questionn aires	1,2,3, 4 & 5, 6, 7 Effectiveness of Delivery of instructions & Assessment Methods

***CIE** – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**47**
2	Applying the knowledge acquired from the course	**50**
3	Analysis	**2**
4	Synthesis (Creating new knowledge)	**0**
5	Evaluation	**0**

Weightage of Marks and blue print of marks for SEE

| Unit | Major Topics | Hours Allotted | Questions to be set for SEE Cognitive Levels | | | | | | Marks weightage | weightage (%) | A* | B* |
			R	U	Ap	Ay	C	E				
1	Introduction , quantity of sewage	6	35%	65%	0%	0%	0%	0%	17	12	1	1
			6	**11**	**0**	**0**	**0**	**0**				
2	Characteristics, analysis of sewage and sewerage system	8	0%	23%	65%	12%	0%	0%	23	16	2	1
			0	**5**	**15**	**3**	**0**	**0**				
3	Sanitation in buildings and sanitary fittings.	10	0%	35%	65%	0%	0%	0%	28	20	1	3
			0	**10**	**18**	**0**	**0**	**0**				
4	Sewage treatment ,and disposal	14	0%	38%	62%	0%	0%	0%	40	27	2	3
			0	**15**	**25**	**0**	**0**	**0**				
5	Surface and storm water drainage and sewerage appurtenances,	6	0%	33%	60%	0%	0%	0%	17	12	1	1
			0	**7**	**10**	**0**	**0**	**0**				
6	Air and noise pollution	7	25%	25%	50%	0%	0%	0%	20	14	2	1
			5	**5**	**10**	**0**	**0**	**0**				
Total		51	10%	37%	50%	2%	0%	0%	145	100	9	10
			11	**53**	**78**	**3**	**0**	**0**				

Legend- R; Remember   U: Understand Ap: Application Ay: Analysis C:Creation E:Evaluvation
A*-SEE QUESTIONS TO BE SET FOR (05MARKS) in PART – A
B*- SEE QUESTIONS TO BE SET FOR (10MARKS) in PART – B

Note to IA verifier: ***The following documents to be verified by CIE verifier at the end of semester***
1. Blue books(20 marks)
2. Student suggested activities report for 5 marks and should be assessed on RUBRICS
3. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

TEXT BOOKS & REFERENCES
1. Water Supply & Sanitary Engineering- by Rangwala .
2. Sewage Disposal and Air pollution - by S.K.Garg.
3. Water Supply & Sanitary Engineering- by G.S.Birde .
4. Environmental Science and Engg Vol-I – by Aloka Debi. (Universities Press)
5. Sanitary Engineering   Vol-II - by Gurucharan Singh.
6. Sewerage and Sewage Treatment Vol-II.– by Fair & Geir.
7. Text Book of Environmental studies – Erach Bharucha (Universities Press)
8. Water Supply, Waste Disposal and Environmental Pollution Engineering-(khanna publication) A.k.chatterjee
9. Waste water Engineering by Dr B.C. Punmia, Jain & Jain

Test/Date and Time	Semester/year		Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM			20
	Year:			

Name of Course coordinator :   Units:__
CO's:____

Question no	Question	MARKS	CL	CO	PO
1					
2					
3					
4					

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	IV SEM	WASTE WATER ENGINEERING	20
	Year: 2015-16	Course code:15EN42T	

Name of Course coordinator
CO1,CO2
Note: Answer all questions

Question		M	CL	CO	PO
1	Explain the importance of sanitation.	3	R/ U	1	1,2,5,6, 8
2	Explain the aims and objectives of sewerage work.	7	U	1	1,2,5,6, 8
3	Write the significance of the following terms in sewage analysis and its limits (i) Solids (ii) Dissolved oxygen (iii) B.O.D. (iv) C.O.D. (v) pH value OR Explain three types of Sewerage system used to convey the sewage. .	10	U/ A	2	1,2,5,6, 10

MODEL QUESTION PAPER (SEE)

Time: 3 Hours]   [Max Marks: 100

*Note***:** i) Answer any SIX questions from PART - A. Each question caries 05 marks.
ii) Answer any SEVEN Questions from PART - B. Each question caries 10 marks.

PART – A

1. Define the terms (i) Sullage, (ii) sewage, (iii) sewerage, (iv) sewer, (v) garbage.
2. Explain the merits and demerits of Combined System.
3. Compare COD over BOD.
4. Explain the requirements of surface drains.
5. Explain the functions of sedimentation tanks.
6. Explain Oxidation ditch with neat sketch.
7. List any five principles of planning and design of house drainage.
8. Define Air Pollution and list classification of air pollutants
9. Illustrate the effects of noise on human life.

PART – B

1. Differentiate between Domestic sewage and Industrial Waste water.
2. Write the significance of the following terms in sewage analysis and its limits
   (i) Solids   (ii) Dissolved oxygen . (iii) pH value   (iv) Chlorides (v) Nitrates
3. Explain different shapes of surface drains and their functions
4. Explain the procedure of design the storm water sewers.
5. Compute the velocity and discharge of a Storm water sewer flowing full of 0.6m dia, laid in a gradient of 1 in 300. Take Manning Constant as 0.012.
6. (a) Write a short note on Rotary Biological Disc.
   (b) Explain the tertiary treatment of sewage
7. Illustrate with sketch the functioning of Trickling filter.
8. With the flow diagram explain the working of Activated Sludge Process (ASP).
9. Explain with a neat sketch the drainage section of Multi storied building.
   as per BIS Code of practice.
10. With a neat sketch explain Electrostatic Precipitator (ESP).

MODEL QUESTION BANK

CO 1: Understand the concept of waste, types of sewage, sewerage system and appurtenances. Estimate the quantity of sewage of a town/city.

REMEMBER LEVEL QUESTIONS

1. State the importance of sanitation.
2. Define the terms (i) Sullage, (ii) sewage, (iii) sewerage, (iv) sewer, (v) garbage.
3. List the sources of sewage

UNDERSTANDING LEVEL QUESTIONS

1. Explain the aims and objectives of sewerage work.   .
2. Explain the factors affecting the quantity of sanitary sewage.
3. Describe Water Carriage System.
4. Differentiate between Domestic sewage and Industrial Waste water.

APPLICATION LEVEL QUESTIONS

1. Estimate the quantity of domestic sewage generated for a town.
2. Explain limiting velocities of sewer.
3. Determine the diameter of a circular sewer to carry sewage of 100 litres/sec when it flows half full with a slope of 1in 350 using Manning's formula.
4. Determine the size of a circular sewer for a discharge of 600 lps running full. Use Manning's formula. Assume i=0.0001 & N=0.015.
5. Calculate the velocity of flow and discharge through a sewer of diameter 0.8m laid at a gradient of 1 in 600. Assume the sewer running full. Use Manning's formula N=0.012.

CO 2: Analyse the Sewage samples using standard test procedures and ascertain the quality of sewage.

UNDERSTANDING LEVEL QUESTIONS

1. Write a short note on Strength of Sewage.
2. Explain various types of waste water sampling methods.
3. Explain the necessity of examination of sewage.
4. Write a note on physical tests of sewage.
5. Explain the three sewerage system used to convey the sewage.
6. Explain the merits and demerits of Combined System.
7. Explain the merits and demerits of Separate system.
8. Compare Separate and Combined sewerage system.
9. Explain the various types of sewers, stone ware, cast - iron, cement concrete, pre-cast sewers, pvc sewers.
10. Explain laying of sewers

APPLICATION LEVEL QUESTIONS

1. Write the significance of the following terms in sewage analysis and its limits
   (i) Solids   (ii) Dissolved oxygen   (iii) B.O.D.   (iv) C.O.D.   (v) pH value (vi) Chlorides (vii) Nitrates.
2. Compare COD over BOD.

CO 3: Compute the quantity of storm water flow in different types of surface drains.

UNDERSTANDING LEVEL QUESTIONS

1. Explain the factors affecting storm sewage.
2. Write a note on RCC sewers.

3. Explain the factors affecting the storm sewage.
4. Explain the requirements of surface drains.
5. Explain different shapes of surface drains and their functions

APPLICATION LEVEL QUESTIONS
1. Calculate the storm water flow using empirical formula for run- off.
2. Explain the procedure of design the storm water sewers.
3. Compute the velocity and discharge of a Storm water sewer flowing full of 0.6m dia, laid in a gradient of 1 in 300. Take Manning Constant as 0.012.
4. Calculate the quantity of storm water in a catchment area for the following design

Area – 32000 hectares, Intensity of rainfall – 16mm/hour and Average permeability factor – 0.5.

5. A Combined sewer of circular section is to be laid to serve a particular area with the following details.

Area to be served = 300 hectares

Population = 1,00,000

Intensity of rainfall =10mm/hour

Rate of supply=135 lpcd

Permeability factor = 0.5

Calculate the size of the sewer when it has to run full at maximum flow with a velocity of 3m/sec.

6. Explain in brief the, location function and construction of various types of sewer appurtenances

(i)Manholes (ii) Drop manholes (iii) Inlets (iv) Catch basins(v) Traps
 (vi) Flushing tanks (vii) Regulators.

7. Sketch Manhole and name the parts.

CO 4: Compare various methods of Sewage treatment and sewage/sludge disposal methods.

UNDERSTANDING LEVEL QUESTIONS

1. Write the functions of (i) Screens (ii) Skimming tanks (iii) Grit chamber
2. With a neat sketch construction of a Screen.
3. Explain the functions of sedimentation tanks.
4. Write a short note on Rotary Biological Disc.
5. Explain the tertiary treatment of sewage
6. Describe Self purification of streams.
7. Explain various methods of sewage disposal.
8. Explain various methods adopted for sludge disposal.
9. Explain Sludge digestion tank with a neat sketch.
10. Explain Sludge drying beds with a neat sketch.
11. Explain the Recycling of Wastewater.

APPLICATION LEVEL QUESTIONS
1. Illustrate with sketch the functioning of Trickling filter.
2. With the flow diagram explain the working of Activated Sludge Process (ASP).
3. Explain Oxidation ditch with neat sketch.
4. Explain Oxidation pond with neat sketch.

5. Explain Aerobic lagoon with neat sketch.
6. Explain anaerobic lagoon with neat sketch.

CO 5: Know the arrangement of sanitary fittings in a building.
UNDERSTANDING LEVEL QUESTIONS

1. Explain the importance and requirements of building drainage.
2. Illustrate the aims and objectives of building drainage.
3. List any five principles of planning and design of house drainage.

APPLICATION LEVEL QUESTIONS
1. Explain with neat sketch the layout of drainage system in Single storied building..
2. Explain with a neat sketch the drainage section of Multi storied building.
3. Explain Gully trap with a neat sketch.
4. Explain with sketch sanitary fittings - water closets , flushing cisterns, urinals, inspection chambers, traps, anti-siphonage
5. Write a short note on Dual pipe system in buildings.
6. Explain testing of house sewers.

CO 6: Identify the sources, effects and preventive measures of air and noise pollution.
REMEMBER LEVEL QUESTIONS

1. Define Air Pollution
2. List classification of air pollutants
3. Define noise
4. List Ambient Air Quality Standards in respect of Noise.

UNDERSTANDING LEVEL QUESTIONS

1. Explain the causes of air pollution.
2. Enumerate the effects of air pollution on human beings.
3. Describe (i)Ozone layer depletion (ii) Acid rain
4. Explain Green house effects and global warming.
5. Explain the effects of noise on human life and its control.
6. Describe about EIS

APPLICATION LEVEL QUESTIONS
1. With a neat sketch explain Electrostatic Precipitator (ESP).
2. Explain the prevention and control of air pollution by control equipment,
   (i) Settling chambers,
   (ii) Cyclone fitters,
   (iii) Scrubbers,
   (iv) Electrostatic precipitators.
3. Illustrate the aims and objectives of EIA.
4. With a neat flow diagram explain the methodology of EIA.

Course Title: **CONCRETE TECHNOLOGY**		
Credits (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE43T**
Type of Course: **Lectures, Self Study & Student activity**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks		SEE- 100 Marks

Pre-requisites: Student should have the knowledge of basics of civil engineering, fundamentals of chemistry and building materials.

Course Objectives:

The student should be able to

1. Adopt the basic knowledge of science and engineering to properties of concrete.
2. Imbibe the culture of professional and ethical responsibilities by following codal provisions in concrete mix design.
3. Identify and solve problems in concrete mix design.
4. Engage in lifelong learning with the advances in concrete technology.

At the end of the course the students should be able to

	Course Outcome	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Define concrete; understand the functional role of ingredients in concrete and the application of concrete as a building material.	R/U/Ap	1,2,3,5	9
CO2	Explain the significance of water cement ratio, differentiate the behavior of concrete in fresh and hardened states, and know the fundamental characteristics of fresh and hardened concrete.	R/U/Ap	1,2,3,4,5	17
CO3	Design concrete mixes as per codal provisions.	R/U/Ap/Ay	1,2,3,4,5,6,7	7
CO4	Summarize the sequence and procedure of concreting operations and the importance of joints in concrete structures.	R/U	1,2,4,5	12
CO5	Discover the need for sustainability and study the usage of waste/ recycled materials in concrete	R/U/Ap/		7
CO6	Evaluate the effect of the environment on service life performance, properties and failure modes of structural concrete and present it as a case study.	R/U/Ap/ Ay/ C	1,2,3,4,5, 6,7,8,9,10	*
			Total sessions	**52**

Legend- R; Remember U:Understand Ap: Application   Ay: Analysis   C:Creation   E: Evaluation
* Related to Student activity beyond classroom hours.

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and Practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Concrete technology	3	3	3	3	3	2	2	1	1	1

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

UNIT	COURSE CONTENTS	HOURS
1	**INTRODUCTION: -** Definition of concrete. Advantages of concrete. Uses of concrete in comparison to other building materials. **CONCRETE INGREDIENTS** **Cement** – Chemical composition, grades of cement, Tests on cement-(fineness, normal consistency, setting time, soundness, and compressive strength) **i) Storing Cement**:- (a) Storing of cement in the warehouse., (b) Storing of cement at site., (c) Effect of storage on strength of cement **Water** -Quality of mixing water, Limits on the impurities as per ISI. **Fine aggregate** – specific gravity, density, moisture content, bulking, sieve analysis, grading of aggregates, deleterious materials, emerging trends of fine aggregate-manufactured sand. **Coarse aggregate** – importance of size, shape and texture, grading of aggregates, sieve analysis, specific gravity, flakiness and elongation index, crushing, impact and abrasion tests. . Aggregate:- Storing of aggregate on site for maintaining uniformity of moisture and cleanliness. **Admixtures** **Chemical admixtures**– (uses and effect):- plasticizers, accelerator, retarders and air entraining gents, carboxyclic based admixtures. **Mineral admixtures** –fly ash, blast furnace slag, meta-kaolin, Silica fume, rice husk ash.	9
2	**Behavior of concrete** Hydration of cement, Bogue's compounds, gel/space ratio, Calcium silicate hydrate, calcium hydroxide, calcium aluminates hydrates, water requirement for hydration, Water Cement Ratio- water cement ratio law and conditions under which the law is valid, Effect of various W/C ratios on the physical structure of hydrated cement, internal moisture, temperature, age, and size of specimen. Definition of cube strength	5

UNIT	COURSE CONTENTS	HOURS
	of concrete. Relations between water cement ratio and strength of concrete, Structure of concrete, transition zone,	
3	**PROPERTIES OF CONCRETE**: **Properties of Fresh concrete**: Workability – definition, factors affecting workability, measurement of workability by slump, compaction factor, vee-bee, flow tests. Segregation and bleeding. **Properties of hardened concrete**:- (a) Strength. Characteristic strength, (b) Durability, (c) Permeability., Factors affecting strength, w/c ratio, maturity concept, effect of aggregate properties, compressive strength, tensile strength, bond strength, modulus of rupture, modulus of elasticity, poisson ratio, the relationship between these parameters., aggregate-cement bond strength. **Shrinkage** – plastic shrinkage and drying shrinkage, factors affecting shrinkage. **Creep** – measurement of creep, factors affecting creep, effect of creep. **Durability** – definition, significance, permeability, Factors contributing to cracks in concrete – plastic shrinkage, settlement cracks, Thermal expansion, and structural design deficiencies. Concrete in Aggressive Environment: Alkali – Aggregate Reaction, Sulphate Attack, Chloride Attack, Acid Attack, Effect of Sea Water, Carbonation, special coating for Water Proofing, Freezing and thawing, Tests on hardened concrete – compressive strength, split tensile strength, flexural strength, non-destructive testing of concrete. (d) Dimensional changes. (iii) Quality Control at site:- Control tests on cement, aggregate water and concrete. Concept of quality control.	12
4	**CONCRETE MIX DESIGN**: Concept of mix design, Objectives of mix design, grades of concrete, different methods of mix design, factors affecting mix proportions variables in proportioning, exposure conditions, Design data for moisture, bulkage, absorption and suitable fine aggregate and coarse aggregate ratio, Procedure of mix design as per IS 10262-2009, numerical examples of mix design as per IS 10262- 2009 and IS 456 Adjustment on site for Bulking, water content, Absorption, Workability	07
5	**CONCRETE OPERATIONS**:- **(ii)Batching**:- (a) Batching of cement, (b) Batching of aggregate: Batching by volume, using gauge box, selection of proper gauge box, Batching by weight-spring balances and by batching machines., (c) Measurement of water. **(iii)Mixing** (a) Hand mixing (b) Machine mixing-types of mixer, capacities of mixers, choosing appropriate size of mixers, operation of mixers, mixing of water.(c) Maintenance and care of machines. precautions before, during and after concreting **(iv)Transportation of Concrete**:- Transportation with and situations of use of the following- pans, wheel barrows, transit mixers, chutes, belt conveyors, pumps, tower cranes. Ready-mix concrete-manufacturing of ready mix concrete **(v) Placement of Concrete** :(a) Prior preparation before placement; when put on natural soil, rocky base, specially prepared sub-base (brick soling and water bound macadam base), hardened concrete base, checking of form work, checking provision for joints. (b) Placement of concrete-precautions to be taken. **(vi) Compaction** :(a) Hand compaction-pavement, narrow and deep members. (b) Machine compaction-types of vibrators-internal and external-Method of handling-suitability for various situations. **(vii)Finishing concrete slabs**-screeding, floating, and trowelling.	14

UNIT	COURSE CONTENTS	HOURS
	Hot Weather Concreting- Cold Weather Concreting-under water concreting **(viii)Curing**:- Object of curing, Method of curing,- conventional and advanced Recommended duration for curing. **(ix)Jointing**:- Importance, types, Location	
6	**Special types of concrete**:- sustainability- application of waste/ recycled materials in concrete. Comparison of the following special concrete with conventional concrete- High strength concrete, fiber reinforced concrete, polymer concrete, ferrocement concrete. Foamed concrete, pervious concrete, high density concrete, self-compacting concrete, high performance concrete, Reinforced Cement concrete pavement quality concrete (Composition advantages and specific applications only) Suggested activity (Case study)	**05**

🎯 SUGGESTED ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Prepare a Spread sheet of concrete mix design template which helps to design the concrete mix and prepare practical test report consulting industry.
2. Prepare a detailed search report of Non-destructive test on concrete and present it.
3. Prepare a literature survey on Repairs and rehabilitation of structures.
4. Design a concrete mix as per ACI.
5. Visit your Institute's Library / internet centre and enlist the books available on the topic given by your teacher. Prepare a bibliography consisting name of the author, title of the book, publication and place of publication. Enlist the magazines, periodicals and journals being available in your library.(any one)
   a) Sustainable concrete buildings / Concrete green building
   b) Present scope of Epoxy and Polyurethane in construction industry.
   c) Strength and durability relationship, volume change in concrete
   d) permeability of concrete
   e) Alkali aggregate reaction,
   f) Chloride attack, sulphate attack etc.
   g) Corrosion of steel - causes of corrosion, remedial measure to control
   h) Ultrasonic Pulse Velocity - techniques of measuring and factors affecting measurement of Ultrasonic Pulse Velocity
   i) Cover meter and Corrosion meter
   j) Polymer concrete
   k) Fiber reinforced concrete
   l) No fines concrete
   m) Ferrocement
6. Writing report on (any one)
      a) Latest standards, specification, Test methods of ASTM /AASHTO/NRMCA.
      b) Case study of Concrete and grunting conducted in any project

c) Study on determine physical properties of ingredients of concrete in laboratory
d) Minimum & Maximum cement content on durability of Concrete
e) Schmidt's rebound hammer test concrete with their limitation
f) Vacuum concrete
g) Shortcreting
h) Vacuum Dewatered Concrete
i) Pavement quality concrete
j) RMC

7. Self-Compacting Concrete (SCC) – Mix Design and methods of testing.
8. Concrete Mix Design by DOE Method.
9. Mix design of fly ash concrete by IS 10262 – 2009.
10. Water permeability test on concrete.

NOTE

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows: (Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good **4,** Exemplary**5**)

2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1,** Developing **2,** Satisfactory **3,** Good **4,** Exemplary5				
1.Literature	5				
2.Fulfill team's roles & duties	2				
3.Conclusion	3				
4.Convensions	4				
Total	13				
Average=(Total /4)	3.25=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be					

given to a group of FIVE students

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Rare Error	No Error

Course Delivery: The course will be delivered through lectures, demonstration, site visits, expert lectures**.**

Course Assessment and Evaluation Scheme:

		What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment method		CIE	IA	Students	Thrice test (Average of three tests)	Test 1	20	Blue books	1,2
						Test 2			2,3
						Test3			4,5
					Mini project		05	Report	1,2,3,4,5
		SEE	End Exam		End of the course		100	Answer scripts at BTE	1,2,3,4,5
Indirect Assessment		Student Feedback on course		Students	Middle of the course			Feedback forms	1, 2, Delivery of course
		End of Course Survey			End of the course			Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

*__CIE__ – Continuous Internal Evaluation   *__SEE__ – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Weightage of Marks and blue print of marks for SEE

Unit	Major Topics	Hours Allotted	Questions to be set for SEE — Cognitive Levels				Marks weightage	weightage (%)	A*	B*
			R	U	Ap	Ay				
1	Introduction to Concrete and Concrete Ingredients	9	40% **10**	20% **5**	40% **10**	0% **0**	25	17	1	2
2	Behavior of concrete	5	70% **10**	30% **5**	0% **0**	0% **0**	15	10	1	1
3	Properties of Concrete	12	50% **15**	50% **15**	0% **0**	0% **0**	30	23	2	2
4	Concrete Mix Design	7	21% **5**	20% **5**	20% **5**	40% **10**	25	13	1	2
5	Concrete Operations	12	50% **15**	33% **10**	17% **5**	0% **0**	30	23	2	2
6	Special types of concrete	7	25% **5**	75% **15**	0% **0**	0% **0**	20	13	2	1
	Total	52	43% **60**	38% **55**	13% **20**	7% **10**	145	100	9	10

A*-SEE QUESTIONS TO BE SET FOR (05MARKS) in PART – A
B*- SEE QUESTIONS TO BE SET FOR (10MARKS) in PART – B (mix design problem compulsory)

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**81**
2	Applying the knowledge acquired from the course	**13**
3	Analysis	**7**
4	Synthesis (Creating new knowledge)	**0**
5	Evaluation	**0**

FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM		20
	Year:		

Name of Course coordinator :   Units:__
CO's:____

Question no	Question	MARKS	CL	CO	PO
1					
2					
3					
4					

Note: Internal choice may be given in each CO at the same cognitive level (CL).

Model Question Paper for CIE (Tests)

Test/Date and Time	Semester/year		Course/Course Code		Max Marks
Ex: I test/6 th week of sem 10-11 Am	IV SEM		Concrete technology		20
	Year: 2015-16		Course code:15CE43T		

Name of Course coordinator :
Course outcome :CO1, CO2
Note: Answer all questions

	Question	M	CL	CO	PO
1	Mention the Chemical composition of cement OR Mention the different test conducted on cement	5	R	1	1,2,3,5
2	Differentiate between chemical admixtures and mineral admixtures?	3	U	1	1,2,5
3	Which test should be conducted to determine the expansion of cement? And how?	6	Ap	1	1,2,3 4,5
4	Write the difference between Gel/space ratio and water cement ratio OR Differentiate between hydration of cement and heat of hydration	6	R/ U	2	1,2,5

Textbooks:

1. Neville A.M., Concrete Technology, Standard Publishers Distributors, Delhi.
2. IS: 10262 – 2009 recommended guidelines for Concrete Mix design – BIS Publications
3. Shetty MS, Concrete technology, Chand S and Co.
4. Gambhir B L, Concrete Technology, Tata McGraw Hill, New Delhi
5. Concrete Technology - Theory & Practice - R.S. Varshney
6. Concrete Technology - A.R.Santhakumar
7. Concrete Technology   R. S. Varshnay New Chand & Brothers,

.

Reference I.S. Codes

1. I.S.4031- (Part 1 to Part 6) Indian standard method of physical tests for hydraulic cement, BIS, New Delhi.

I.S.4031 (Part 1) - 1996 Part 1 – Determination of fineness by dry sieving. I.S.4031(Part 2) -1999 Part 2 – Determination of fineness by air permeabilitymethod.

I.S.4031(part 3) -1988 (reaffirmed 2000) Part 3– Determination of soundness
I.S.4031(part 4) - 1988 (reaffirmed 1995)

Part 4 - Determination of consistency of standard cement paste. I.S.4031 (part 5) – 1988, (reaffirmed 2000) Part 5 - Determination of initial and final setting times

I.S : 4031 (part 6) – 1988, (reaffirmed 2000) Part 6 - Determination of compressive strength of hydraulic cement other than masonry cement

2. I.S : 2386 (part i to part vi) – 1963 Indian standard methods of test for aggregate for concrete. BIS, New Delhi.

Part i - Particle size and shape. (reaffirmed 1997) Part ii - Estimation of deleterious materials and organic impurities. (reaffirmed 2002)

Part iii - Specific gravity, density, voids, absorption & bulking. (reaffirmed 1997) Part iv - Mechanical properties (reaffirmed 1997)

part v - Soundness. (reaffirmed 1997) part vi - Measuring mortar making properties of fine aggregate. (reaffirmed 2002)

3. I.S. : 383 – 1970 Indian standard specification for coarse & fine aggregates from natural sources for concrete. B.I.S.., New Delhi.

4. I.S. : 1911 - 1959 (reaffirmed) Indian Standard methods of sampling and analysis of concrete), B.I.S.., New Delhi.

5 I.S. : 456 - 2000 Indian standard , plain and reinforced concrete – code of practice. (fourth revision), B.I.S.., New Delhi.

6. I.S. : 516 – 1959 Indian standard methods of tests for strength of concrete (xii reprint December 1987), B.I.S.., New Delhi.

7. I.S. : 8112- 1989 Indian standard - 43 grade ordinary portland cement Specification

8. I.S. : 12269 – 1987 (reaffirmed 1999) Indian standard specification for 53 grade O.P.C..

9. I.S. : 9103 – 1999 Indian standard –concrete admixtures specification 10. I.S. : 455- - 1989 (reaffirmed 1995) –Indian standard – Portland slag cementspecification 11. I.S. : 1489 (part 1) 1991 – Portland – Pozzolana Cement – specification

part 1 fly ash based 12. I.S. : 7861 (part 1) 1975 (reaffirmed 1997) – Indian standard of practice forextreme weather concreting part 1 recommended practice for hot weather concreting

13. I.S.: 7861 (part 2) – 1981 (reaffirmed 1997) – Indian standard of practice For extreme weather concreting part 2 – recommended practice for cold weather concreting

13. I.S. : 8041 – 1990 – Indian standard – rapid hardening Portland Cement specification BIS- New Delhi

14. I.S. : 12330 – 1988 (reaffirmed 1995) – Indian standard specification for sulphate resisting Portland cement

15. I.S : 12600 - 1989 (reaffirmed 1995) - Portland cement, low heat Specification

16. I.S : 10262 – 1982 Indian standard recommended guidelines for concrete mix

design

Sp 23 handbook on concrete mixes (based on Indian standards) 18. I.S. 13311 (part-1 & 2)-1992 methods of non-destructive testing of concrete.

part-1 ultrasonic pulse velocity, part-2 rebound hammer.

E-Links

http://ict.concrete.org.uk/links.asp

http://elearning.vtu.ac.in/16/ENotes/ConcreteTechnology/Unit8-MCN.pdf

http://elearning.vtu.ac.in/10CV42.html

http://www.theconcreteinstitute.org.za/

http://www.aboutcivil.org/concrete-technology.html

http://nptel.ac.in/syllabus/syllabus.php?subjectId=105102012

http://nptel.ac.in/courses/105102012/1

www.btechguru.com/courses

http://www.faadooengineers.com/register.php

Model Question Paper
Diploma in Civil Engineering
4th semester
Course title: **CONCRETE TECHNOLOGY**
Time; 3Hrs. Max.marks: 100
Students can carry IS10262-2009
Assume any missing data suitably
Part –A
Answer any six each question carries 5 marks
1.Differentiate between Chemical admixtures and Mineral admixtures ?
2.Write the difference between Gel/space ratio and water cement ratio ?
3. Define workability? What are the factors affecting workability?
4.Explain Sulphate Attack & Chloride Attack ?
5.What are the factors affecting design of concrete mix?
6.Write the situation of use the following equipments wheel barrows, transit mixers, chutes, pumps, tower cranes
7.List the various methods of curing of concrete each with examples?
8.Explain Reinforced Cement concrete?
9. List some of the waste/ recycled materials can be used in concrete?

Answer seven (Question No. 10 compulsory and any six) each question carries 10 marks

1. Explain Quality of mixing water in concrete? What are the permissible limits of impurities in water as per ISI?
2. Which test should be conducted to determine the expansion of cement ? And how?
3. Write short note on Calcium silicate hydrate and Calcium aluminates hydrates?
4. What is creep and shrinkage of concrete? List the factors affecting creep and shrinkage of concrete?
5. Differentiate between bleeding and segregation. Explain their effects on Concrete
6. Why is concrete mix design necessary? List the design data required for concrete mix design
7. Explain in details a) Hot weather concreting b) Light weight concrete
8. Why is vibrator required in concreting? Discuss the various types of vibrators used in concreting
9. Difference between High strength concrete and high performance concrete?
10. Design Concrete Mix Proportion for M30 grade by IS 10262 - 2009.

DESIGN STIPULATIONS FOR PROPORTIONING	TEST DATA FOR MATERIALS

Grade designation : M30
 Type of cement : OPC 43 grade confirming to IS 8112
 Maximum nominal size of aggregates:20mm
 Minimum cement content : 320 kg/m3
 Maximum water cement ratio : 0.4
 Workability : 100 mm (slump)
 Exposure condition: Severe
 Method of concrete placing : Pumping
 Degree of supervision : Good
 Aggregate type: Crushed angular aggregate
 Maximum cement content : 400 kg/m3
 Chemical admixture type : Superplasticizer
	Cement: OPC 43 grade confirming to IS 8112
	 Specific gravity of cement : 3.15
	 Chemical admixture : Super plasticiser conforming to IS 9103
	 Specific gravity of coarse aggregate : 2.74
	   Fine aggregate : 2.74
	 Water absorption coarse aggregate : 0.5%
	   Fine aggregate : 1.0 %
	 Free (surface) moisture Coarse aggregate : Nil (absorbed moisture also nil)
	   Fine aggregate : Nil
	 Sieve analysis coarse aggregate : Conforming to Table 2 of IS: 383
	 Fine aggregate Conforming to Zone I of IS383

Model Questions Bank

Unit 1- Introduction to Concrete and Concrete Ingredients
Cognitive level -Remember

1. Define concrete.
2. Mention the Chemical composition,
3. What are the grades of cement?
4. Mention the different test conducted on cement
5. Define fineness,
6. Define normal consistency,
7. What are the impurities limits in water as per ISI?
8. Mention the various test conducted on Fine aggregate
9. List the various test conducted on Coarse aggregate
10. What is manufactured sand or robo sand
11. What are method of storing of aggregate on site for maintaining uniformity of moisture and cleanliness ?
12. Define Admixtures ?
13. Mention the different types of admixtures?
14. Write a note on fly ash

15. Write a note on blast furnace slag
16. Write a note on meta-kaolin
17. Write a note on Silica fume
18. Write a note on rice husk ash
19. Write a note plasticizers
20. Write a note accelerator,
21. Write a note retarders
22. Write a note air entraining gents,
23. Write a note carboxyclic based admixtures.
24. What are different types of admixture used in concrete?
25. What are different types of admixture used in concrete?

Cognitive level -Understand

1. What are the advantages of concrete?
2. What are the uses of concrete in comparison to other building materials?
3. Explain the setting time of cement,
4. Explain the test conducted on normal consistency of cement?
5. Explain the test conducted on fineness of cement?
6. Explain the test conducted on setting time of cement?
7. Explain the test conducted on soundness of cement?
8. Explain the Storing of cement in the warehouse?
9. Explain the test conducted on specific gravity of fine aggregate?
10. Explain the test conducted on density of fine aggregate?
11. Explain the test conducted on moisture content of fine aggregate?
12. Explain the test conducted on bulking of fine aggregate?
13. Explain the test conducted on sieve analysis of fine aggregate?
14. Explain the test conducted on sieve analysis of Coarse aggregate?
15. Explain the test conducted on specific gravity of Coarse aggregate?
16. Explain the test conducted determine flakiness and elongation index of Coarse aggregate?
17. Explain the crushing tests on Coarse aggregate?
18. Explain the impact test conducted on Coarse aggregate?
19. Explain the abrasion tests on Coarse aggregate?
20. Explain the test conducted on specific gravity of coarse aggregate?
21. What do you mean by grading of aggregates
22. Differentiate between Chemical admixtures and Mineral admixtures ?
23. Mention any one uses and effect of each different types of Chemical admixtures
24. Mention any one uses and effect of each different types of Mineral admixtures
25. How does the carboxyclic based admixtures works?
26. Enlist the physical properties of cement. Explain setting time of cement with neat sketch.
27. Define fineness modulus of sand. Explain test procedure to calculate the Also state value as per IS standard.
28. Enlist mechanical properties of coarse aggregate. Explain any two in detail.
29. What is significance of fineness modulus of sand? Explain test procedure to calculate the F. M.
30. Explain detailed procedure to determine Aggregate Crushing Value?
31. Explain in detail effect of air entraining agents on concrete?
32. Explain the effects of different chemical admixture on fresh concrete.
33. Explain the advantages in using Pozzuoli admixture in concrete.
34. Explain in detaileffect of super-plasticizer on concrete?
35. What do you mean by Pozzuoli admixture? Explain in detail Fly Ash?
36. Explain Air-entraining Admixture and the effect of Air Entrainment on the Properties of

Concrete.

Cognitive level –Application
1. How do you arrive at compressive strength of cement?
2. How do you store cement at site?
3. What are the effects of long storage of cement and suggest how to overcome it?
4. What are the features/properties/quality of fine aggregate should look for while preparing concrete?
5. What are the features/properties/quality of coarse aggregate should look for while preparing concrete?
6. How size, shape and texture of Coarse aggregate is important in concrete
7. What are admixtures that can be added to minimize the heat of hydration of cement?
8. How do you use rice husk ash as a building material?
9. How do you ensure grading of aggregates at site
10. Which test should be conducted to determine the expansion of cement ? And how?
11. List the permissible Limits of impurities in water as per IS code
12. why use of fly ash and met kaolin in fresh concrete

Unit 2- Behavior of concrete
Cognitive level -Remember
1.What are the Bogue's compounds,
2.Define Gel/space ratio,
3.Briefly note on Calcium silicate hydrate?
4.Write a short note on Calcium aluminates hydrates,
5.What is the minimum water requirement for hydration of cement?
6.Define Water Cement Ratio
7.Define water cement ratio law?
8.What are the effect of various W/C ratios on the physical structure of hydrated cement?
9.Definition of cube strength of concrete?
10. Write the Relations between water cement ratio and strength of concrete?
11. Brief about structure of hydrated cement paste?
12. Explain transition zone in concrete?
13. Explain the effect of w/c ratio and gel space ratio on strength of concrete
Cognitive level -Understand
1. Explain Hydration of cement and heat of hydration
2. What is the role of Calcium hydroxide in cement ?
3. Write the difference between Gel/space ratio and water cement ratio
4. Differentiate between hydration of cement and heat of hydration
5. Differentiate between Calcium silicate hydrate, Calcium hydroxide & Calcium aluminates hydrates,
6. How are Calcium silicate hydrate, Calcium hydroxide &Calcium aluminates hydrates formed in concrete?
7. Write a note on water requirement for hydration of cement?
8. State the conditions under which the water cement ratio law is valid?
9. What are the effect of internal moisture on the physical structure of hydrated cement?
10. What are the effect of various temperature on the physical structure of hydrated cement?
11. What are the effect of age, and size of specimen on the physical structure of hydrated cement?

12. Explain the phenomenon of hydration of cement and its effect on Strength of cement.
13. Explain Heat of Hydration and Water Requirements for Hydration?
14. Explain how shape and texture of aggregate affected strength of concrete?
15. Write detail procedure of measuring slump of fresh concrete? Explain different types of slump failure.
16. Explain how gel/space ratio affecting strength of concrete?

Unit 3- Properties of Concrete
Cognitive level -Remember

1. What are the properties of Fresh concrete
2. Define Workability
3. What are the factors affecting workability
4. What are the Properties of hardened concrete
5. What are the factors affecting shrinkage.
6. Define Creep Explain measurement of creep?
7. Define Durability ?
8. Define permeability,
9. Write a short note on Carbonation,
10. Mention some of the special coating for Water Proofing of concrete
11. Mention the different tests conducted on hardened concrete
12. Define Segregation
13. Define bleeding
14. What are the different non-destructive test conducted on concrete.
15. Define compressive strength of concrete
16. Define tensile strength of concrete
17. Define bond strength of concrete
18. Define modulus of rupture of concrete
19. What are the values of modulus of elasticity, poisson ratio of concrete
20. Write the relation between compressive strength and modulus of elasticity
21. Write a note on aggregate-cement bond strength.
22. Write the relation between compressive & tensile strength of concrete
23. Define Shrinkage
24. What is modulus of elasticity and explain its relation with strength.
25. Enlist different tests on Hardened Concrete? Explain any one in detail?
26. Explain characteristic strength, compressive strength and flexural strength on concrete.
27. Explain creep of concrete and how determine the creep of concrete in laboratory.
28. What is modulus of elasticity and explain its relation with strength.
29. Explain Freezing and thawingphenomena of concrete.
30. Explain in details factors contributing to Cracks in Concrete.
31. Explain in details the methods for controlling the sulphate attack on Concrete
32. What you mean by NDT? Explain any one method in detailed

Cognitive level -Understand

1. Explain the properties of Fresh concrete:
2. Explain the factors depending upon workability
3. Explain the test conducted on measurement of workability by slump test
4. Explain the test conducted on measurement of workability by compaction factor test
5. Explain the test conducted on measurement of workability by vee-bee test
6. Explain the test conducted on measurement of workability by flow test
7. Differentiate between Segregation and bleeding?

8. Explain the Properties of hardened concrete
9. Differentiate between plastic shrinkage and drying shrinkage,
10. What are the factors affecting creep? Explain effect of creep.
11. What are the factors contributing to cracks in concrete
12. Write a short note on Alkali – Aggregate Reaction,
13. Write a short note on Sulphate Attack,
14. Write a short note on Chloride Attack,
15. Write a short note on Acid Attack,
16. What are the effect of Sea Water on concrete,
17. Explain how to determine compressive strength of concrete
18. Explain how to determine split tensile strength of concrete
19. Explain how to determine flexural strength,
20. Write short note on rebound hammer test
21. Write short note on Ultrasonic pulse velocity test
22. What are the factors affecting strength of concrete?
23. Explain maturity concept?
24. Explain effect of aggregate properties strength of concrete?
25. How do you ensure concrete quality Control at site
26. Differentiate between bleeding and segregation. Explain their effects on Concrete
27. Explain in detail factors affecting strength of concrete?
28. Explain in details types of concrete shrinkage?
29. Explain how to determine dynamic modulus of elasticity and its relation with static modulus of elasticity
30. Explain effect of w/c ratio on durability and permeability of concrete.
31. Explain the importance on minimum & maximum cement content on durability?
32. Explain the techniques of measuring and factors affecting measurement of Ultrasonic Pulse Velocity.
33. Explain in detail Schmidt's rebound hammer to test concrete with their limitation (with figure)
34. Explain the techniques of measuring and factors affecting measurement of Ultrasonic Pulse Velocity.
35. Explain in detail Schmidt's rebound hammer to test concrete with their limitation (with figure)

Unit 4- Concrete Mix Design
Cognitive level -Remember
1. Define Grades of concrete,
2. Mention the different methods of mix design,
3. List the design data required for concrete mix design
4. What are the factors affecting mix proportions
5. Provide the details of exposure conditions provided in the code
6. Explain the procedure of mix design as per IS 10262-2009,
7. What are the factors affecting design of concrete mix?
8. Enlist varies method of mix design? Write data to be collected for a mix design?
Cognitive level -Understand
1. Why concrete mix design necessary?
2. Explain the concept of mix design?
3. What are the objectives of mix design?
4. Write a note on adjustment on site for Bulking while preparing concrete?

5. Explain adjustment on site for water absorption of materials while preparing concrete during rainy season?
6. Write a note on adjustment on site for Workability while preparing concrete ?
7. What are methods of compaction of concrete used for making good quality concrete? Explain in brief
8. Explain different exposure condition as per IS 456 – 2000 provision.
9. Explain the importance on minimum & maximum cement content on durability?
10. Explain detail procedure of concrete mix design by IS 10262 - 2009
11. Explain method of expressing proportions and also what do you mean by acceptances criteria?

Cognitive level : application & analysis

1. Design concrete mix design for proportioning

    m) Grade designation: M40

    n) Type of cement: OPC 43 grade confirming to IS 8112

    o) Type of mineral admixture: Fly ash confirming to IS 3812 (Part-1)

    p) Maximum nominal size of aggregates: 20 mm

    q) Minimum cement content: 320 kg/m3

    r) Maximum water cement ratio: 0.45

    s) Workability: 100 mm (slump)

    t) Exposure condition: Severe (for reinforced concrete)

    u) Method of concrete placing: Pumping

    v) Degree of supervision: Good

    w) Type of aggregate: Crushed angular aggregate

    x) Maximum cement content: 450 kg/m3

    y) Chemical admixture type:Superplsticizer

    A-2 TEST DATA FOR MATERIALS

    h) Cement used: OPC 43 grade confirming to IS 8112

    i) Specific gravity of cement: 3.15

    z) Fly ash used: Fly ash confirming to IS 3812 (Part-1)

    j) Specific gravity of fly ash: 2.2

    k) Chemical admixture: Super plasticiser conforming to IS 9103

    l) Specific gravity of Coarse aggregate: 2.74 Fine aggregate: 2.74

    m) Water absorption Coarse aggregate: 0.5 percent Fine aggregate: 1.0 percent

    n) Free (surface) moisture coarse aggregate: Nil (absorbed moisture also nil) Fine aggregate: Nil

    o) Sieve analysis coarse aggregate: Conforming to Table 2 of IS: 383 Fine aggregate: Conforming to Zone I of IS: 383

Unit 5- Concrete Operations
Cognitive level -Remember

1. Explain in details a) Hot weather concreting b) Light weight concrete c)Cold weather concreting d) High Density Concrete
2. What do you know about Batching ?
3. Explain different types of Transportation of Concrete
4. What is Ready-mix concrete-
5. Explain different Methods of curing?
6. Mention different types of joints and its location?

Cognitive level -Understand

1. Describe the various methods of mixing of concrete

2. Why is vibrator required in concreting? Discuss the various types of vibrators used in concreting
3. What are precautions is to be taken during hot and cold weather concreting?
4. Differentiate between Hand mixing & Machine mixing ?
5. What are the precautions taken before, during and after concreting in concrete mixing machines?
6. Write the situation of use the following equipments pans, wheel barrows, transit mixers, chutes, belt conveyors, pumps, tower cranes.
7. Explain manufacturing of ready mix concrete
8. Explain Finishing concrete slabs-screeding, floating, and trowelling.
9. Why curing is necessary?
10. Why water is used in curing the concrete?
11. what is the recommended duration for curing of concrete?

Unit 5- Special types of concrete
Cognitive level -Remember

1. Explain in details a) Polymer concrete b) Fiber reinforced concrete c) Nofines concrete d) Ferrocement
2. Explain in details a) Self Compacting Concrete (SCC) b) High performance concrete
3. Explain different types of fiber used in concrete?
4. What is fiber reinforced concrete, mention any two advantages and its specific application ?
5. What is polymer concrete mention any two advantages and its specific application ?
6. What is ferrocement concrete mention any two advantages and its specific application ?
7. What is Foamed concrete mention any two advantages and its specific application ?
8. What is pervious concrete mention any two advantages and its specific application ?
9. What is high density concrete mention any two advantages and its specific application ?
10. What is self-compacting concrete mention any two advantages and its specific application ?
11. What is high performance concrete mention any two advantages and its specific application ?
12. What is pavement quality concrete mention any two advantages and its specific application ?
13. List some of the waste/ recycled materials can be used in concrete?

Cognitive level -Understand

1. Compare conventional concrete and self-compacting concrete
2. Compare conventional conventional concrete & High strength concrete,
3. Mention advantages of application of waste/ recycled materials in concrete?
4. Difference between High strength concrete and high performance concrete?

Some of the suggested activities

1. Flyash – building blocks for the future
2. Flyash -cement stabilized soil blocks
3. Pollution studies in silk industry experimental investigations on replacement of sand by quarry dust in concrete

4. Experimental investigation on recycled aggregate concrete
5. To find the influence of the size of the aggregate of the compressive strength of concrete
6. Ferro cement composite with no-fines concrete
7. Lime -fly ash - soil blocks
8. A study on effects of light weight aggregates on compressive and flexural strength of concrete
9. Studies on partial replacement of cement by red mud in motor
10. A study on low cost housing material bricks made up of building waste
11. Experimental investigations on replacement of sand by graded quarry dust in concrete
12. Development of traditional water proofing agents (using natural resins) for economy in construction
13. Compressive strength of stabilised blocks and masonary prisms
14. Preliminary investigations on red soil cement stabilised coconut shell blocks
15. Laboratory study on cement- stabilised iron-ore rejections
16. Variations in strength of concrete and masonary units
17. Crushed stone dust cement blocks
18. Stabilized manganese-ore tailings blocks
19. Mangalore tile waste as coarse aggregate in concrete
20. Effect of blast furnace sl*g on soil-cement stabilization
21. Stabilized haalu mannu blocks
22. Portable low cost ferrocement water tank
23. Flyash concrete door shutters
24. Development of masonry mortar using limestone polished slurry and cement
25. Utilization of man made waste in man-made structures
26. Flyash laterite bricks
27. Properties and suitability of fine quarry dut for the final coat plastering and impervious layer
28. Suitability of beach sand as fine aggregate for concrete
29. Characteristics properties of concrete with mixed fibres using waste plastic and waste coiled steel fibres
30. Waste plastic fibre reinforced concrete with polymers-turning pollution to solution
31. Investigation on coiled fibre reinforced concrete with tile waste as coarse aggregate
32. Effect of microsilica-600 on the properties of waste plastic fibre reinforced concrete
33. Concreting practices in belgaum - a case study
34. Comparative study of strength of welded mesh and expanded metal in ferrocement
35. Behaviour of filler slab in low cost housing
36. Study of geo-technical and strength parameters of laterite blocks in and around karkal talaq
37. Design and construction of folded ferrocement boat
38. Experimental study on utilization of silica fume in concrete
39. The strengths of recron 3s fibrous concrete with and without super plasticizers
40. Experimental study on utilization of blast furnace sl*g in concrete
41. Determination of aggregate shape factors using universal thickness-length guage
42. An experimental study on enhancement of strength of concrete embers using wrapping technology
43. A study on the use of rice husk ash in concrete from sustainability consideration
44. Mix design for self compacting concrete
45. Utilization of pozzolanic wastes in the production of wastes coiled fibre reinforced concrete
46. Use of recycled aggregates,waste plastic fibres and flyash in the production of bituminous mix for flexible pavements
47. Effective utilization of bauxite residue(red mud) in brick making
48. Fibre reinforced concrete and cocktail fibre reinforced concrete as repair materials

49. Experimental studies on mix proportioning and strength properties of pavement quality and lean concrete with high volume flyash
50. Study on blending of quarry dust in large volume for structural component available in udupi and d k
51. Study on utilisation of building materials from demolished structures
52. An experimental study on effect of ratio of different sized coarse aggregates on compressive strength of self compacting concrete
53. Sustanable and cost effective building material technology through partial replacement of cement by granite cutting slurry waste powder and partial replacement of coarse aggregates by mangalore tile bats for arch lintels

54. Design and evaluation of high volume flyash concrete for rigid pavement overlays
55. Geopolymer mortar
56. Geopolymer concrete
57. Study on strength behaviour of concerte using foundry dust in fine aggregate
58. Enhancing the strength properties of recycled aggregate concrete through the use of supplimentary cementing materials
59. Experimental studies on air entrained ferrocement panels with high volume fly ash and compatibility of its connection
60. Rice husk ash concrete blocks
61. Mix design and strength characteristics of reactive powder concrete
62. Experimental study on resistance of self compacting concrete to elevated temperature and verification of ratio of compressive strengths of cube to that of cylinder for scces
63. Waste of material in the construction industry

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	Course Title: **PROFESSIONAL ETHICS & INDIAN CONSTITUTION**		
PROFESSIONAL ETHICS	Scheme (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15CE44T**
	Type of Course: **Lectures, Self Study& Quiz**	Credit :**04**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Prerequisites: Enthusiasm to learn the subject

Course Objectives:

1. To create an awareness on Engineering Ethics and Human Values.
2. To instill Moral and Social Values and Loyalty.
3. Create awareness among engineers about their social responsibilities
4. Appreciate the Ethical issues
5. To Know the Human rights and concept of women empowerment
6. To know features of our constitution.

Course Outcomes:

7,
8: *On successful completion of the course, the students will be able to attain CO:*

	Course Outcome	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Practice the moral values that ought to guide the Engineering profession.	*R/U*	5,6,7,8,10	**10**
CO2	Discover of the set of justified moral principles of obligation, ideals that ought to be endorsed by the engineers and apply them to concrete situations	*U/A*	5,7,8,10	**09**
CO3	Know the definitions of risk and safety also discover different factors that affect the perception of risk	*R/U*	5,6,7,10	**05**
CO4	Appreciate the Ethical issues and Know the code of ethics adopted in various professional body's and industries	*R/U*	5,6,7,10	**06**
CO5	Justify the need for protection of human rights and to know about concept of women empowerment	*R/U*	5,6,7,8,10	**8**
CO6	Know the successful functioning of democracy in India	*R/U*	5,6,7,9,10	**14**
		Total sessions		**52**

Legend: R; Remember, U: Understand A: Application

COURSE-PO ATTAINMENT MATRIX

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
PROFESSIONAL ETHICS & INDIAN CONSTITUTION	-	-	-	-	3	3	3	3	2	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.
If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3
If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2
If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1
If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

COURSE CONTENT AND BLUE PRINT OF MARKS FOR SEE

Unit No	Unit Name	Hour	Questions to be set for SEE			Marks weightage	weightage (%)
			R	U	A		
1	HUMAN VALUES	10	15	15	-	30	21
2	ENGINEERING ETHICS	09	10	15	-	25	17
3	SAFETY, RESPONSIBILITIES OF ENGINEERS	05	05	-	10	15	11
4	ETHICAL ISSUES IN ENGINEERING PRACTICE	06	05	05	5	15	11
5	HUMAN RIGHTS	8		15	5	20	13
6	INDIAN CONSTITUTION	14		25	15	40	27
	Total	52	35	75	35	145	100

Legend: R; Remember, U: Understand A: Application

UNIT I: HUMAN VALUES   10Hrs

Professional Ethics-Objectives of study of professional ethics-Human values- Definition of Morals and Ethics-Difference between Morality and Ethics-Values-Definition-Types of values- Definition of Integrity- Concept of Work Ethic- Service Learning- Definition Virtues-Definition-Civic Virtue-Duties and Rights - Respect for Others – Attitude and values, opinions-changing attitude-beliefs-Reliability-Living Peacefully-Means to be adopted for leaving peacefully-Caring-Sharing-Honesty-ValuingTime-Co-operation-Commitment-Empathy-Self-Confidence-Spirituality.

UNTII: ENGINEERING ETHICS   09Hrs

Engineering ethics-Definition-Approach-Senses of Engineering Ethics-variety of moral issues– Inquiry-Types-Moral dilemmas-Steps to solve dilemma-Moral autonomy –Definition-consensus & controversy –Profession-Definition–Ethical theories-Theories about right action Personality–Self control- Self-interest –Self respect.

UNITIII: SAFETY, RESPONSIBILITIES OF ENGINEERS   05Hrs

Safety and risk-definition- - assessment of safety and risk - risk benefit analysis and reducing risk –Personal risk-Public risk-Reducing risk-Voluntary Risk-Collegiality and loyalty–Authority-Types- collective bargaining -occupational crime –Responsibility of engineers–Types-Social responsibility-Professional responsibility-confidentiality-conflicts of interest-liability

UNIT IV:ETHICAL ISSUES IN ENGINEERING PRACTICE   06Hrs

Ethical issues–Industrial standards-Environmental ethics –Plastic waste disposal-E-Waste Disposal-Semi conductor waste Disposal-Industrial waste disposal-Human centred environmental ethics- computer ethics –Types of issues-Computer as the Instrument and Object of Unethical Acts -Engineers as managers-Codes of ethics-Sample code of Ethics like -Institution of Engineers(India)-Institute of Electrical & Electronics engineers- Institute of Electronics & Telecommunication Engineers - Indian Institute of Materials Management.

UNIT V: HUMAN RIGHTS   8 Hrs

Human Rights-Definition-constitutional provisions-right to life and liberty-Human Rights of Women-Discrimination against women- steps that are to be taken to eliminate discrimination against women in Education, employment, health care, Economic and social life, Women in rural areas- Status of Women in India - Constitutional Safeguards - Dowry Prohibition act 1961- Domestic violence act 2005- Sexual harassment at work place bill 2006-Human Rights of Children- Who is a child- list the Rights of the Child- Right to education--Protection of Children from Sexual Offences Act(POCSO)-2012- National Human Rights Commission-Constitution- Powers and function of the Commission-Employee rights- Provisions made-Contractual-Non contractual employee rights-Whistle blowing-definition-Aspects-Intellectual Property Rights (IPR)–Meaning-Need for protection- Briefly description of concept of patents, Copy right, Trade mark.

Introduction to constitution of India-Formation and Composition of the Constituent Assembly-Salient features of the Constitution-Preamble to the Indian Constitution Fundamental Rights- Fundamental Duties-Directive principles of state policy.

Parliamentary system of governance- Structure of Parliament- Lokhasabha and Rajyasabha - Functions of parliament- Legislative ,Executive, Financial Function, Powers of Loksabha and Rajya Sabha- Procedure followed in parliament in making law-Structure of union executive-Power and position of President, Vice President, Prime minister and council of ministers. Structure of the judiciary: Jurisdiction and functions of Supreme Court, high court, and subordinate courts

Federalism in the Indian constitution, Division of Powers- Union list, State list and concurrent list, Structure of state legislation, Legislative assembly and Legislative council, Functions of state legislature, Structure of state executive-Powers and positions of Governor, ,Speaker, Deputy Speaker, Chief Minister and council of minister.

Local self government- meaning-Threetiersystem-Villagepanchayath-Talukpanchayath-Zillapanchayath-Local bodies-Municipalities and Corporations, Bruhath mahanagara Palike. Functions of Election commission, UPSC, KPSC.

TEXT BOOKS

1. Naagarazan, R.S. , "Professional Ethics and Human Values " New age International http://www.imd.inder.cu/adjuntos/article/524/Professional%20Ethics%20and%20Human%20Values.pdf
2. Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall,

3. NCERT_Indian_Constitution_at_Work_Political_Science_Class_11_www.upscportal.com (1)

REFERENCES

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice HallofIndia,NewDelhi,2004.
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics - Concepts and Cases", Wadsworth Thompson Learning, United States, 2000
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi,2003.
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001
5. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York, 1996.
6. Introduction to the Constitution of India- Dr.Durga Das Basu
7. Empowerment of rural women in India-Hemalatha H.M and RameshwariVarma,HemaPrakashana.

LIST OF LEARNING WEBSITES:
1. http://www.imd.inder.cu/adjuntos/article/524/Professional%20Ethics%20and%20Human%20Values.pdf
2. http://www.course.sdu.edu.cn/G2S/eWebEditor/uploadfile/20131017113401956.pdf

Note: The following or similar Case study related for assessing CIE (IA) for 10 marks

1	Teacher form the group of 5- 6 students, Ask to think by each student, about an important value acquired from their child hood and the value still retained with them and value they rejected. Ask to share the values retained and explore what has made to reject some values. Make report
2	The construction company wants to make a feasibility study of a proposed ring road near your city. It hires Civil engineer for this purpose. The engineer learns that the project would have a very negative impact in term of pollution, economy, and lives of low income rural population. The Engineer had no intention of divulge the information during public hearings. What should the Engineer as Adviser to do? Make report
3	The computer engineer develops a computer program used as a tool in developing other programs assigned to him. He uses the facilities of the company to develop the program. He changes jobs and takes the only copy of the first program with him for use in his new job. Will it be a violation of the employer's right? Does he require previous employer's permission before using it on the new job? Make report
4	A manufacturing enterprise pays their Technicians Trainees overtime salary and a handsome bonus to work during a strike period. The strike was organized by the union against the unsafe working conditions of the plant. You, considered as a Technician trainee, believe that the conditions may be unsafe even though no government regulations apply. What will you do? Make report Options: 1. Refuse to work, because thinking that the allegations of the union have merit 2. Refuse to work because believing that breaking the strike is unethical. 3. Continue to work, because he feels this is an obligation to the employees 4. Continue to work because it will help clear some of his pending commitments 5. Work, because otherwise Management is likely to be fired and cannot get alternate job.
5	A woman who was driving a car was involved in an accident. The vehicle dashed against the divider. She had fallen unconscious. You are passing by your vehicle. She is known to you, alive and stable. You are going to appear for an interview for Air Force recruitment. Is it (or) is it not your duty to save her from suffering? You are likely to fulfill a duty of protecting the country. What you will do .Apply Ethical theory on this situation. Make report
6	Teacher form the group of 5- 6 students, Ask to Visit local general hospital/leading Nursing homes. Ask them to observe how their hospital wastes being disposed. Will they follow the safe disposable measures? Assess how it will violate their environmental ethics. Make report

MORE SUGGESTED CASE STUDY FOR UNDERSTANDING THE COURSE

Case Studies: Study the cases given in text book *Vide page number 120 to page number 138*: *Naagarazan, R.S "Professional Ethics and Human Values* "New age International (E-link :http://www.imd.inder.cu/adjuntos/article/524/Professional%20Ethics%20and%20Human%20Values.pdf) and analyzes the ethical issues and comment on what one should do. State ethical principles, codes of ethics of professional societies, to support your comments.

Course Delivery:
- The course will be delivered through lectures and Power point presentations/ Video
- Teachers can encourage the students to take case study and make the report of the same.

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three tests (Average of three tests to be computed)	20	Blue books	1,2,3,4,5,6
				One Case study	05	Report	1,2,3,4,5,6
				Total	25		
	SEE	End Exam		End of the course	100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1 & 2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

Note: I.A. test shall be conducted for 20 marks. After taking average of three tests marks, any decimals shall be rounded off to the next higher digit.
Example only: RUBRICS/CRITERIA FOR ASSESSING STUDENT's CASE STUDY (5 Students in a group).

Dimension	Scale					Students Score				
	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	1	2	3	4	5
1. Research and gather data information	Does not collect information relate to topic	Collects very limited information, some relate to topic	Collects basic information, most refer to the topic	Collects more information, most refer to the topic	Collects a great deals of information, all refer to the topic	3				
2.Full fills teams roles and data interpretation	Does notable to interpret data perform any duties assigned to the team role	slightly able to interpret data and Performs very little duties	Not precisely able to interpret data and Performs nearly all duties	Precisely Able to interpret Data and Performs almost all duties	Excellent in interpreting data and Performs all duties of assigned team roles	4				
3.Shares work equally	Always relies on others to do the work	Rarely does the assigned work, often needs reminding	Usually does the assigned work, rarely needs reminding	Always does the assigned work, rarely needs reminding.	Always does the assigned work, without needing reminding	5				
4. Listen to other team mates and able to conclude	Is always talking, never allows anyone to else to speak not able to infer	Usually does most of the talking, rarely allows and the others to speak and slightly able to infer	Listens, but sometimes talk too much and able to infer	Listens and talks a little more than needed and able to precisely conclude	Listens and talks a fare amount and excellently conclude this opinion	2				
Grand Average/Total						14/4=3.5 ~ 4				

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	% in Weightage
1	**Remembering**	**35**
2	**Understanding**	**50**
3	**Application**	**10**
4	**Analysis (activities)**	**05**

FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code			Max Marks
Ex: I test/6 th weak of sem 10-11 Am	I/II SEM	**PROFESSIONAL ETHICS & INDIAN CONSTITUTION**			20
	Year:	**15CE44T**			

Name of Course coordinator :   Units:__
CO's:____

Question no	Question	MARKS	CL	CO	PO
1					
2					
3					
4					

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	CL	CO	PO
Ex: I test/6 th weak of sem 10-11 Am	IV SEM	**PROFESSIONAL ETHICS& INDIAN CONSTITUTION**			20
	Year: 2015-16	Course code: **15CE44T**			

Name of Course coordinator :   Units:1,2 and CO: 1,2

Note: Answer all questions and carry equal marks

Question no	Question	CL	CO	PO
1	List the factors for one to work peacefully.	R	1	5,6,7
2	Illustrate the ethical aspect principle of caring or sharing, with an example? OR Explain various actions of an engineer leading to dishonesty?	A	1	5,6,7
3	State the specific virtues relating to honesty? OR List the situations when moral dilemmas arise?	R	2	5,7,8
4	Explain the relation between autonomy and authority?	A	2	5,7,8

PROFESSIONAL ETHICS & INDIAN CONSTITUTION

Time: **3 Hours**]   [Max Marks: **100**

Note: *Answer any SIX from Part A and any SEVEN from Part B*

PART-A   6x5=30 marks

1. Distinguish between 'morality' and 'ethics'

2. Explain the terms, 'Profession', 'Professional', and 'Professionalism'?

3. Name a few techniques (steps) to reduce risks?

4. List the ill effects of E waste disposal on environment?

5. Explain the role of computers as object of Unethical Acts?

6. State various provisions under 'human rights?

7. Differentiate between 'Patent' and 'Trade secret'?

8. State the function of Governor?

9. Write Note on gram panchayaths?

PART-B   7x10=70 marks

10. Illustrate the ethical aspect principle of caring or sharing, with an example?

11. Explain various actions of an engineer leading to dishonesty?

12. List the situations when moral dilemmas arise?

13. Distinguish between 'corporate responsibility' and 'corporate accountability?

14. Explain Occupational crime?

15. Explain code of Ethics followed in Institution of Engineers?

16. Explain Sexual harassment at work place bill 2006?

17. Explain the basic structure of Parliament?

18. Explain the formation and functions of state high Court?

19. State the role of following members in Rajyasabha?:

    a) Chairman

    b) Leader of the house

    c) Opposition leader

Course title: PROFESSIONAL ETHICS & INDIAN CONSTITUTION

CO1: PRACTICE THE MORAL VALUES THAT OUGHT TO GUIDE THE ENGINEERING PROFESSION.

Level-1: Remember
1. Define Engineering Ethics?
2. State the two approaches to Engineering ethics?
3. List different meanings of 'ethics'.
4. List the key trends in engineering ethics?
5. Distinguish between 'morality' and 'ethics'?
6. List different types of values and give a few examples in each?
7. List the civic virtues one should develop?
8. List the types of virtues, with an example for each
9. List the factors for one to work peacefully?
10. List different ways the honesty reflects?
11. List the benefits of empathy?
12. Define 'character'. and 'spirituality'?

Level-2: Understand
13. How do the human values evolve?
14. Explain the term 'respect for others' with suitable example?
15. Explain what should one do or not to do live peacefully?
16. Distinguish between 'caring' and 'sharing'?
17. What are the impediments to proper co-operation?
18. Explain the factors that shape self-confidence in a person?
19. Explain two methods of developing self-confidence?
20. Illustrate the ethical aspect principle of caring or sharing, with an example?
21. Explain various actions of an engineer leading to dishonesty?
22. Explain Service Learning and discuss on its components?
23. Explain any two Human values in detail?

CO2: DISCOVER OF THE SET OF JUSTIFIED MORAL PRINCIPLES OF OBLIGATION, IDEALS THAT OUGHT TO BE ENDORSED BY THE ENGINEERS AND APPLY THEM TO CONCRETE SITUATIONS

Level-1: Remember
1. List the objectives of this course 'professional ethics'?
2. Define the term, 'moral dilemma'?
3. List the situations when moral dilemmas arise?
4. List the steps in confronting moral dilemma?
5. State the five characteristics of professionals?
6. State the specific virtues relating to honesty?
7. Define 'corporate responsibility'
8. Define 'corporate accountability?
9. List the skills required to handle moral problems/issues in engineering ethics?

Level-2: Understand
10. Why do people behave unethically?
11. Why and how do moral problems arise in a profession?
12. Explain the moral dilemma
13. Explain the difficulties in solving moral problems?

14. Explain the relation between autonomy and authority?
15. Highlight the principle of 'pre-conventional level' of moral development?
16. Explain the terms, 'Profession', 'Professional', and 'Professionalism'?
17. Describe the virtues fulfilled under professional responsibility?
18. Distinguish between 'corporate responsibility' and 'corporate accountability'?
19. What is moral integrity? Write on its significance?
20. Differentiate between self-respect and self-esteem.?
21. Distinguish between causal responsibility, moral responsibility and Legal responsibility?
22. What is meant by Professional Responsibility?
23. Where and how do moral problems arise in engineering practice? Justify the safety and other obligations of professional engineers?

CO3: KNOW THE DEFINITIONS OF RISK AND SAFETY ALSO DISCOVER DIFFERENT FACTORS THAT AFFECT THE PERCEPTION OF RISK

Level-1: Remember
1. Name the factors that influence the perception of risk?
2. List the factors that affect the risk acceptability?
3. Name a few techniques (steps) to reduce risks?
4. List various aspects of collegiality?
5. List factors/principles to justify 'confidentiality'?
6. State the difference between 'bribe' and 'gift'?

Level-2: Understand
7. What is meant by 'safe exit', in the study of safety?
8. Describe 'institutional authority' with an example?

Level-3: Application
9. Explain 'collective bargaining with example?
10. Explain briefly ''institutional authority?
11. Explain Occupational crime?

CO4: APPRECIATE THE ETHICAL ISSUES AND KNOW THE CODE OF ETHICS ADOPTED IN VARIOUS PROFESSIONAL BODY'S AND INDUSTRIES

Level-1: Remember
1. List the ill effects of E waste disposal on environment?
2. Define 'computer ethics'? List the issues in 'computer ethics'?
3. Name different types of problems in 'computer ethics'?
4. List the ethical problems by computers in workplace?
5. List the ethical features involved in computer crime?

Level-2: Understand
6. Describe briefly on code of ethics?
7. Write note on Industrial standards?
8. What are the duties of an engineer as an experimenter, in environmental ethics?
9. How the plastic waste disposals create havocs?
10. Discuss on Industrial waste disposal creating disasters on environment?

Level-3: Application
11. Explain 'environmental ethics'?

12. Explain human centred environmental ethics?
13. Explain the role of computers as instruments?
14. Explain the role of computers as object of Unethical Acts?
15. Explain the role of engineers as managers?
16. Explain code of Ethics followed in Institution of Engineers?
17. Explain code of Ethics followed in engineering council of India?
18. Explain code of Ethics followed in TATA group?
19. Explain code of Indian Institute of Materials Management?

CO 5: JUSTIFY THE NEED FOR PROTECTION OF HUMAN RIGHTS AND TO KNOW ABOUT CONCEPT OF WOMEN EMPOWERMENT

Level-1: Remember
1. State various provisions under 'human rights?
2. List the features of 'international human rights?
3. State the provisions under professional rights?
4. State the features of the employee rights?
5. List the principles of *conflict resolution?*
6. List the ethical responsibilities of consulting engineers?
7. List the various Special Programs for Women's Development from government?

Level-2: Understand
8. Describe briefly 'trademark'?
9. Differentiate between 'Patent' and 'Trade secret'?
10. Describe briefly 'right of conscientious refusal'?
11. Describe 'right to due processes?
12. Describe 'intellectual property rights?

Level-3: Application
13. Explain briefly the 'copyright'?
14. Explain briefly about patents?
15. Explain on the participation in professional societies? `
16. Explain the concept of women empowerment?
17. Explain woman and Development?
18. Explain Dowry Prohibition act 1961?
19. Explain POCSO act 2012?
20. Explain domestic violence act 2005?
21. Explain Sexual harassment at work place bill 2006?

CO6: KNOW THE SUCCESSFUL FUNCTIONING OF DEMOCRACY IN INDIA

Level-1: Remember
1. List the function and powers of parliament?
2. State the positions and powers of the Governor?
3. State the powers and Functions of the Chief Minister?
4. State the functions of Taluk panchayaths?
5. State the functions of Zilla panchayaths?
6. List the functions of urban local bodies?
7. State the powers of the president?
8. State the functions of the president?

9. State the powers and Functions of the prime minister?

Level-2: Understand

10. Describe briefly about Indian constitution?
11. Write about structure of Parliament?
12. What are the Procedure followed in parliament in making law?
13. Describe the role of gram panchayaths in community upliftment?
14. Describe the role of: a) Chairman b) Leader of the house c) Opposition leader in Rajyasabha?
15. Describe importance of Judiciary?
16. Describe the Structure of state legislation
17. Describe the Jurisdiction of Supreme court,
18. Describe the Jurisdiction high court?

Level-3: Application

19. Explain theFormation & Composition of constituent assembly?
20. Explain preamble and its main objectives of Indian constitution?
21. Explain the fundamental Rights of Every citizen?
22. Explain the fundamental Duties of Every citizen?
23. Explain salient features of Indian constitution?
24. Explain the basic structure of Parliament?
25. Explain the composition of Lokasabha?
26. Explain the composition of Rajyasabha?
27. Explain the Directive principles of state policy?
28. Explain the Structure Of The Judiciary?
29. Explain the Powers of Rajya Sabha and Loksabha ?
30. Describe briefly about, Division of Powers- Union list, State list and concurrent list,
31. Explain the federalism in the Indian constitution ?
32. Explain the role of vice president?
33. Explain the role of State council of ministers?
34. Explain the functions of Zilla panchayaths?
35. Explain the formation and functions of Supreme Court?
36. Explain the formation and functions of state high Court?
37. Explain the formation and functions of subordinate courts?
38. Explain the formation of three tier system for local self government?

	Course Title: **SOIL & MATERIAL TESTING LAB**		
	Credits (L:T:P) **0:2:4**	Total Contact Hours: **78**	Course Code: **15CE45P**
	Type of Course: **Practical's, Task work**	**Credit :03**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 50 Marks

Pre-requisite: Knowledge of strength of materials, Materials of construction.

Course objectives

1. To provide the basic knowledge of science and engineering with respect to properties of construction materials and to *identify* problems in choosing the suitable materials in any construction site.

2. Ability to apply knowledge of Mathematics and Engineering in calculating the mechanical properties like tensile strength, compressive strength etc.

3. Ability to *communicate* effectively about mechanical properties of materials, and apply the knowledge in design of concrete structures, soil subgrade and pavements.

4. Understands use of modern *instruments* and engage in life-long learning with the advances in material testing without inhibiting *professional and ethical responsibility*.

On successful completion of this course, the student will be able to

	Course Outcome	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Reproduce the basic knowledge of mathematics, science and engineering in assessing the quality and suitability of construction materials, structural element, & preparation of test reports as per the IS specification, by inculcating professional and ethical responsibility in the areas of material testing & modern instrument usage	R/U/Ap/ Ay/C	1,2,3,4,5 ,7,8,9	72
CO2	Formulate and solve in teams in order to improve future problem solving ability in material engineering and able to present it.	R/U/Ap/Ay	1,2,3,4,5 ,6,7,8,9, 10	6
			Total sessions	**78**

Legend- R; Remember   U: Understand   Ap: Application   Ay: Analysis   C:Creation   E: Evaluation

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Soil & Material Testing Lab	3	3	3	3	3	3	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

Tests on Cement as per IS code	**9**

1. Determination of Fineness by Surface area (Blaine air Permeability apparatus / 90 micron sieve)
2. Determination of Specific gravity
3. Normal Consistency & Setting time
4. Test on Grade of Cement (Mortar Cube)

Tests on Aggregate as per IS code	**9**

1. Specific gravity of Fine Aggregate and Coarse Aggregate
2. Water absorption test of Fine Aggregate and Coarse Aggregate
3. Grading analysis of Fine and Coarse Aggregates
4. Bulking of sand.
5. Bulk Density of Coarse Aggregate

Tests on cement concrete as per IS code	**15**

1. Slump test
2. Compaction factor test
3. Compressive strength of Concrete cubes and Split Tensile test for cylinders.
4. Non destructive testing (Rebound hammer or Ultra sonic pulse velocity)

Tests on Road Materials as per MORTH Specifications	**9**

1. Abrasion test on road aggregates by Los Angeles (Abrasion Testing Machine)
2. Impact test on road aggregates.

Tests on other Building Materials as per IS Code	**6**

1. Water absorption test & Compression test on bricks or building blocks
2. Tensile test on steel

Tests on Soils as per IS code	**18**

1. Grain Size analysis of soils
2. Atterberg limits a) Liquid limit   b) Plastic limit c) Shrinkage limit

3. Tests on Moisture content of soil (Oven drying method)
4. Field Density of Soil By Core cutter
5. Standard Proctor Compaction Test on soil

*Test reports should be done for all experiments. Formats should be followed as per industries or IS codes, this should be integrated in the Graded exercise for each experiment.

Suggested activities

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Collect the information with proper justification for the fine aggregates used for different constructional activities such as foundation, plastering, concreting etc mentioning zonal classification.
2. Extraction of disturbed and undisturbed soil samples and finds field density.
3. Presentation on Strain gauges, strain indicators, extensometer.
4. Prepare and compare Soil classification chart as per IS and ASTM or 3 Phase system.
5. Writing and Collecting test report formats by consulting industry on various construction materials other than given experiments.
6. Collecting Specifications of various materials and correlate with standards.
7. Collecting and study of various IS codes regarding testing of materials.
8. Spread sheet of concrete mix design template
9. Collection of minimum compression strength values and water cement ratio of concrete used for different structural components from IS codes
10. Tests on grouting and its applications
11. Comparative study of M-sand with Natural sand
12. Tools and equipment with pictorial presentation chart
13. Finding unit weight of various diameters of HYSD and TMT steel and compare with theoretical calculations.
14. Model of plate load test.
15. Water absorption test on Fine and coarse aggregate.
16. Field tests on various building materials such as cement, sand, brick etc as per codes.
17. A study of local soils for rammed earth construction
18. Study of strenght and properties of eucalyptus as a truss material
19. Rammed earth wall
20. Role of geo synthetic in the improvement of strength of soil
21. Compressive strength characteristics of stacked stabilised soil cement blocks
22. Strength properties of bhalki soil
23. Stabilization of soft soils using industrial wastes
24. Study of strength parameters of silica fume concrete
25. Study on infiltration rate on different soils of your city/town/locality
26. Effect of ph on physical properties of fine-grained soils
27. A study of laterite particles in adsorption of oil and grease

NOTE

1. Students should select any one of the above or other topics relevant to the subject approved

by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily

submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows: (Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary **5**)

2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary**5**				
1.Organisation	3				
2.Fulfill team's roles & duties	4				
3.Conclusion	5				
4.Convensions	2				
Total	14				
Average=(Total /4)	14/4=3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Course Delivery: The course will be delivered through lectures and Power point presentations/ Video/ demonstration / Practices/ Site visits / Expert lectures.

Course Assessment and Evaluation Scheme

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Twice test (Average of twice tests)	10	Blue books	CO1,CO2
				Record	10	Graded exercise	CO1,CO2
				Task work	05	Task work reports	CO1,CO2
	SEE	End Exam		End of the course	50	Answer scripts at BTE	CO1,CO2
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	CO1 Delivery of course
	End of Course Survey			End of the course		Questionnaires	CO1,CO2 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note:
1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student task work activities.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	25
2	Applying the knowledge acquired from the course	40
3	Analysis	20
4	Synthesis (Creating new knowledge)	10
5	Evaluation	5

TEXT BOOKS
1. Timoshenko and Young, Strength of Materials - Vol II, Von Nastrand Company, New York
2. Laboratory Manual prepared by the Department
3. Shetty M.S, 'Concrete Technology S. Chand & Co. Ltd, New Delhi.
4. Mehta P.K, 'Properties of Concrete Tata McGraw Hill Publications, New Delhi
5. Reference Books:
6. Neville AM, 'Properties of Concrete ELBS Publications, London.
7. Relevant BIS codes.

REFERENCES
1. Concrete Technology By MS Shetty (S. Chand Publication 16 Edition)
2. IS Codes
   a) IS 8112:1989 -43 Grade OPC Specification
   b) IS-4031-PART-2
   c) IS 12269:1987 -53 Grade OPC Specification
   d) IS 1489(PART -I) :1991- Portland Pozzolona Cement Specification
   e) IS 383:1970 – Specification for Coarse & fine Aggregate for Concrete
   f) IS 456 :2000 – Pain & RCC Code of Practice
   g) IS 1786:1985 – Specification for HYSD Steel bars & wires for RCC
   h) IS 2185 PART-I:1979–Specification for Concrete masonry units Hollow & Solid Concrete Blocks
   i) IS 1077 :1992 – Common Burnt Clay Building Bricks Specifications
   j) IS 2720 Part III – Determination of water contents of Soil
   k) IS 2720 Part IV – Grain size analysis of Soil
   l) IS 2720 Part V– Determination of Liquid limits & Plastic Limits of Soil
3. Material Testing Lab Manual – Gambir.
4. Soil Testing Manual – HD Charan & KS Grover.
5. MORTH (Ministry Of Road Transport and Highways) Specifications

1. http://site.iugaza.edu.ps/mymousa/files/Material_-Testing-lab-manual.pdf
2. http://www.technicalsymposium.com/CIVIL_SEM5_CE2307LM.pdf
3. http://docslide.us/documents/som-bmt-lab-manual-final.html

SCHEME OF EXAMINATION

	Material & Soil Testing Laboratory	
1	Writing Procedure for a Question	10
2	Conduction of a Experiment	10
3	Tabulation/Calculation	10
4	Result / Conclusion	5
5	Viva	5
6	Task work	5
7	Record	5
	Total	**50**

LIST OF EQUIPEMENTS AND APPARATUS

Sl.No	Name of Equipments and Apparatus	No
1	Blaine's permeability Apparatus	6
2	Density/specific Gravity Bottle	6
3	Vicat Apparatus with Accessories	6
4	Mortar cube Moulds 50mm2 (7.06x7.06)	6
5	Pycnometer	6
6	Sieve10, 4.75, 2.36, 1.18mm, 600,300,150micron with lid & Pan(Concrete Fine agg.)	2 sets
7	Measuring Jars of 1000, 500, 100, 10ml	3
8	Mechanical sieve Shaker for the above set of sieves	1
9	Sieve 80, 40, 20, 4.75 mm with Lid & Pan(Coarse Agg.)	2sets
10	Measuring Cylinder(metal) 15 l, 250mm dia and 300mm height	3
11	Mechanical sieve Shaker for the above set of sieves	1
12	Slump Cone with accessories	3
13	Compaction factor testing machine	3
14	Concrete cube moulds150x150x150mm	6
15	Concrete cylindrical moulds150mm dia, 300mm height	3
16	Compression Testing Machine of 200 tonne capacity	1
17	Universal Testing Machine of 40 tonne capacity	1
18	Sieve 125, 90, 63, 45, 22.4, 13.2, 11.2 mm with Lid & Pan(Road aggregate)	2sets
19	Mechanical sieve Shaker for the above set of sieves	1
20	Los angels abrasion testing machine with charges	1
21	Impact testing machine with 12.5mm & 10mm Sieve with lid & pan	1

Sl.No	Name of Equipments and Apparatus	No
22	Digital weighing Balance 12 kg capacity with minimum 1 gm accuracy	3
23	Hot air Oven	1
24	Steel containers	10
25	Core cutter with dolly	3
26	Standard proctor compaction apparatus	2
27	Atterberg limits apparatus	2
28	Sieve100,63,40,20,,10,4.75,2 ,1 mm &600,425,212,150,75 micron with lid & pan (Soil test)	2
29	Rebound hammer	1
30	Ultra sonic pulse velocity kit	1
31	Strain gauage with stand	2
32	Strain indicator	1

Model Question bank (Viva voce aid)

OBJECTIVE QUESTIONS ON COMPACTION FACTOR TEST ON CONCRETE

Q.1. Compaction factor test is used to measure

(a) water cement ratio

(b) workability

(c) compressive strength

(d) tensile strength

Q.2. Compaction factor test is used for

(a) dry mixes where slump test generally fails

(b) wet mixes where slump test generally fails

(c) both dry and wet mixes

(d) none of these

Q.3. In compaction factor(C.F.) test, the two top and middle hoppers are

(a) cylindrical

(b) hexagonal

(c) rectangular

(d) conical

Q.4. In compaction factor test, the bottom container is

(a) conical

(b) rectangular

(c) hexagonal

(d) cylindrical

Q.5. In compaction factor test, if the weight of concrete in bottom cylinder(without compaction) is w and that of after filling a similar concrete and compaction, is W, then

(a) C.F. = W/w

(b) C.F. = w/W

(c) C.F. = loge(W/w)

(d) C.F. = loge(w/W)

Q.6. C.F. for concreting of small sections with vibration should be

(a) 0.75 to 0.80

(b) 0.80 to 0.85

(c) 0.85 to 0.92

(d) greater than 0.92

Q.7.   C.F. for concreting of lightly reinforced sections with vibration should be

(a) 0.75 to 0.80

(b) 0.80 to 0.85

(c) 0.85 to 0.92

(d) greater than 0.92

Q.8.   C.F. for concreting of lightly reinforced sections without vibration should be

(a) 0.75 to 0.80

(b) 0.80 to 0.85

(c) 0.85 to 0.92

(d) greater than 0.92

Q.9.   C.F for concreting of heavily reinforced sections without vibration should be

(a) 0.75 to 0.80

(b) 0.80 to 0.85

(c) 0.85 to 0.92

(d) greater than 0.92

Q.10.   Slump for concreting of lightly reinforced sections without vibration should be

(a) 10 to 15 mm

(b) 15 to 25 mm

(c) 25 to 75 mm

(d) 75 to 125 mm

1. Define hardness
2. Which hardness tests and scales would you use for very thin strips of materials, such as   aluminum foil?
3. Which one of the following materials has the highest hardness?
   (a) Aluminum, (b) diamond, (c) steel, (d) titanium
4. Hardness is the ability of a material to

   A.   Return to the original shape after being bent.

   B. Resist penetration.

   C. Stand deformation (bending) without breakage.

   D. Stretch before breakage.

1. The ultimate strength of steel in tension in comparison to shear is in the ratio of
   a) 1:1
   b) 2:1
   c) 3:2
   d) 2:3
2. The formula to find double shear strength is_____
   a) Load/Area
   b) Load/2XArea
   c) Load X Area
   d) Load X (2*Area)
3. The machine in which the double shear test conducted is _____
4. The number of pieces in double shear test of a steel rod after failure is_____
   a) 1
   b) 2
   c) 3
   d) 4

5. The number of pieces in single shear test of a steel rod after failure is_____
a) 1
b) 2
c) 3
d) 4

6. Unit of shear strength is_____

Key Answers:
1) C
2) B
3) UTM/ Compression Testing Machine
4) C
5) B
6) N/mm^2

COMPRESSIVE STRENGTH OF CONCRETE

1) Define compressive strength?
2) Define compressive strength of concrete?
3) What is the meaning of "M" in Grade M20

1. A first class brick when immersed in cold water for 24 hours should not absorb water more than
a) 15%
b) 20%
c) 22%
d) 25%
Ans: b

2. Crushing strength of a first class brick should not be less than
a) 3.5 N/mm2
b) 7.0 N/mm2
c) 10.5 N/mm2
d) 14.0 N/mm2
Ans: c

3. The main function of alumina in brick earth is
a) To impart plasticity
b) To make the brick durable
c) To prevent shrinkage
d) To make the brick impermeable

Ans: a

4. The percentage of alumina in a good brick earth lies between
a) 5 to 10%
b) 20 to 30%
c) 50 to 60%
d) 70 to 80%
Ans: b

5. Excess of alumina in brick earth makes the brick
a) Impermeable
b) Brittle and weak
c) To lose cohesion
d) To crack and warp on drying
Ans: d

6. The nominal size of the modular brick is
a) 190 mm x 90mmx 80 mm
b) 190 mm x 190 mm x 90 mm
c) 200 mm x 100 mm x 100 mm
d) 200 mm x 200 mm x 100 mm
Ans: c

7. Percentage of silica in a good brick earth lies between
a) 5 to 10%
b) 20 to 30%
c) 50 to 60%
d) 70 to 80%
Ans: c

8. Excess of silica in brick earth results in
a) Cracking and warping of bricks
b) Loss of cohesion
c) Enhancing the impermeability of bricks
d) None of the above
Ans: b

9. Which of the following ingredients of the brick earth enables the brick to retain its shape ?
a) Alumina
b) Silica
c) Iron
d) Magnesia
Ans: b

10. Which of the following pairs gives a correct combination of the useful and harmful constituents respectively of a good brick earth ?
a) Lime stone and alumina
b) Silica and alkalies
c) Alumina and iron
d) alkalies and magnesium
Ans: b

11. The process of mixing clay, water and other ingredients to make brick is Known as
a) Kneading
b) moulding
c) pugging
d) Drying
Ans: a

12. Advantage of a clamp compared to a kiln for burning bricks is that
a) It takes less time for burning
b) It gives more output of first class bricks
c) It has less initial cost
d) It is suitable when bricks are required in large numbers
Ans: c

13. The internal size of mould used in brick preparation is
a) Equal to the size of a fully burnt brick
b) Smaller than the size of a fully burnt brick
c) greater than the size of a fully burnt brick
d) None of the above
Ans: c

14. Pug mill is used for
a) Preparation of clay
b) moulding of clay
c) Drying of bricks
d) Burning of bricks
Ans: a

15. Which of the following bricks are used for lining of furnaces?
a) overburnt bricks
b) unburnt bricks

c) Refractory bricks
d) First class bricks
Ans: c

16. The frog of the brick in brick masonry is generally kept on
a) Bottom face
b) Top face
c) Shorter side
d) Longer side
Ans: b

17. Number of bricks required for one cubic metre of brick masonry is
a) 400
b) 450
c) 500
d) 550
Ans: c

1. In the cement test Vicat needle is used to the determination of
   a) Initial & final setting time
   b) fineness
   c) normal consistency
   d) specific gravity

2. In Vicat test, the final setting is assumed when the attachment of the needle fails to make any impression on the mould but the needle
   a) Penetrates the sample by 5 mm
   b) makes just an impression on the sample
   c) does not penetrate the sample
   d) pierce the sample by 10 mm

3. Initial setting time of cement should not be less than
   a) 15 minutes
   b) 30 minutes
   c) 28 minutes
   d) 1 hour (IES 1992)

4. Final setting time of cement should not be more than
   a) 1 hour
   b) 2 hours

c) 5 hours
d) 10 hours

5. Which of the following pairs in respect of ordinary Portland cement are correctly matched?
   1.Initial setting time……30 min. 2. Final setting time…….10 hours 3. Normal consistency…..10% 4.Soundness of cement is tested by Vicat apparatus
   Select the correct answer using the codes given below
   a) 1 and 4
   b) 2 and 3
   c) 1 and 2
   d) 1 and 3

6. The ability of cement to maintain a constant volume is called
   a) flashing
   b) honeycombing
   c) soundness
   d) creep

7. Soundness test of cement is done to determine its
   a) durability in sea water
   b) free lime content
   c) iron oxide content
   d) alumina content

8. Soundness of cement is tested by
   a) Vicat apparatus
   b) Le Chatalier apparatus
   c) soundness meter
   d) Duff Abrams apparatus

9. In the soundness test, the whole assembly is immersed in water at a temperature of
   a) 19 ± 1^0C
   b) 27 ± 1^0C
   c) 37 ± 1^0C
   d) 47 ± 1^0C

10. In the soundness test, the whole assembly is immersed in water for
    a) 30 minutes
    b) 1 hour

c) 24 hours
d) 48 hours

11. In the cement the compound quickest to react with water, is
    a) Tri caicium aluminate
    b) Tetra- calcim alumino-ferrite
    c) Tricalcium silicate
    d) Di- calcim silicate

12. Ultimate strength to cement is provided by
    a) Tri caiciumsilicate
    b) Di- calcim silicate
    c) Tricalcium aluminate
    d) Tetra calcium alumino ferrite

13. In a motor, the building material is
    a) Cement
    b) Sand
    c) Surkhi
    d) Cinders

14. The difference between 53 grade cement and 43 grade cement is
    a) Fineness & Compressive strength
    b) Soundness
    c) Tensile strength
    d) Color

15. For normal consistency test of OPC the attachment kept of movable rod is
    a) Plunger(10mm dia 50mm long)
    b) Needle (1mm^2)
    c) Needle with annular ring
    d) Needle (2mm^2)

16. The component added to increase the initial setting time in OPC is
    a) Gypsum
    b) Alumina
    c) Calcium
    d) Manganese

1. The resistance of the material to failure by impact is termed as ………………..
   A) Strength
   B) Toughness
   C) Hardness
   D) None of these
2. In case of impact test, the aggregate kept in the mould is subjected to ……………. Blows
3. The height of fall in case of impact test is ………………mm
   A) 380mm
   B) 420mm
   C) 308mm
   D) 300mm
4. What is the test sample used in case of impact test?
5. What is the difference between impact load and crushing load
6. Los Angeles test is used to test aggregates for its abrasion resistance. (**True/False**)
7. List the test conducted to find the aggregate abrasion value
8. In case of aggregate crushing value the compression load is applied at the rate of ……………. Tones/min.
   A) 40T/min
   B) 4T/min
   C) 400T/min
   D) 0.4T/min
9. Match the following
   A) 10% fineness test
         shock
   B) Aggregate impact test
         crushing
   C) Los Angeles test
         abrasion

   FINE AGGREGATE
1. The ability of aggregate to resist excessive changes in volume is referred as
   ………………..
2. Define specific gravity
3. Differentiate between coarse aggregate and fine aggregate
4. Match the following

   A) Specific gravity
                           Oven drying method
   B) Moisture content
                           Sieve analysis
   C) Fineness modulus
                           Pyconometer
5. What is necessity of conducting Sieve Analysis in case of fine aggregate?
6. The aggregate fraction from 80mm to 4.75mm are termed as ………..
   A) Coarse aggregate
   B) Fine aggregate
   C) All-in aggregate
   D) Graded aggregate
7. For testing specific gravity, the sample should be dried to a constant mass at …………… º C
8. Differentiate between absolute specific gravity and apparent specific gravity.
9. Strength of quality of concrete depends on
   A) Aggregate shape
   B) Aggregate grading
   C) Surface area of the aggregate
   D) All of these
10. Maximum size of fine aggregate should not exceed 4.75mm (**True/False**)
11. Bulking of aggregate is due to ………………….
    A) Moisture content
    B) Absorbed water
    C) Voids
    D) Less compaction
12. If angularity number of a aggregate is increased when workability of concrete will ……….
    A) Increase
    B) Decrease
    C) No change
    D) None of these

13. In concrete the fine Aggregate is used to fill up the voids in ……………………..
    A) Cement
    B) Coarse aggregate
    C) Sand
    D) None of these

14. According to IS 460-1962 sieve size varies from ……………..
    A) 160mm to 25 μ
    B) 120mm to 50 μ
    C) 80mm to 75 μ
    D) None of these

15. Match the following
    A) Coarse aggregate

       passes through 4.75mm
    B) Fine aggregate

       retained on 4.75mm
    C) Dividing line between FA and CA
                4.75mm

16. Combination of Fine aggregate and Coarse aggregate is called …………………….
    A) Single sized aggregate
    B) Graded aggregate
    C) All-in aggregate
    D) All the above

17. Fineness modulus of fine aggregate is in the range of ………….
    A) 2-3.5
    B) 3.5-5
    C) 5-7
    D) 5-8.5

18. What is meant by fineness modulus?

19. If fineness modulus is 6.2, what does it indicate?

20. The nature of graph in fineness modulus is ………………… cuve.

1. The Minimum size of coarse aggregate is --------

2. The sieve analysis graph consists of % of ------- on Y axis and sieve size in log value x axis

    a) passing   b) retained
                c) cumulative passing   d) cumulative retained

3. The size of coarse and fine aggregate is differentiated by
        a) >4.75   b)<4.75   c)=4.75   d) none of the above

4. The unit of fineness modulus is ------

5. The fineness modulus of fine aggregsate is 2.51, it can be graded as
        a) fine sand   b) Medium sand   c) Very fine sand   d) coarse sand

6. The inert ingredient of a concrete mix is --------

7. Workability of concrete can be increased by
        a) increase in maximum size of aggregate b) decrease in temperature
        c) use of round aggregate which has smooth surface texture   d) all of the above

8. The maximum nominal size of the coarse aggreagate is determined by sieve analysis
        and is designated by the sieve size hiher than the largest size on the the material
        retained is more than
        a) 5%   b) 15%   c) 25%   d) 50%

9. Sieve analysis of coarse aggregate is done as per IS code-------

10. 150micron sieve size is equal to --------mm

Answers:
1. 4.75   2. c)   3.c)   4.no unit
    5.a)   6. Aggregate 7. d)   8. d)

9. 2386 (Part I) – 1963   10. 0.150

Objective type questions:

1. Increase volume of sand due to the pressure of surface moisture is called ----------

2. Bulking of sand is expressed in
----

3. The bulking will be greater
when the sand is
   a) Finer   b) coarser)
      c)medium

4. Whether the following
statement is true or false:
      The maximum volume is
      reached when all sand
      particles have their surface
      completely covered and
      pore spaces filled with
      water

5. Whether the following
statement is true or false:
      The texure, surface tension
      and capillarity will affect
      the bulking of sand

6. Specify the Is code which gives
the bulking characteristics of
sand -------

7. When the sand is completely
saturated with water , the
volume in terms of dry sand can
be taken
   a) Equal b) more c) less
      d) none of these

8. Differentiate fine and coarse
sand by sieve size
   a) 4.25 b) 4.5 c) 4.75 d)
      2.36

9. Bulking of sand is due to
   a) Viscosity b) air voids c)
      surface moisture d)porosity

10. The preferable measurement of sand is
---------batching

Answers:

1. Bulking of sand
2. 2. Percentage
3. 3. a)
4. 4. True
5. 5. True
6. 2386 (part III)-1963

7. a)

8. b)

9. c)

10. Weigh

1. Strength and quality of concrete
depends on
   a. Aggregate shape
   b. aggregate
      grading
   c. Surface area
      of aggregate
   d. all of these

2. What is the normal range
of absorption capacity of the coarse
aggregate by
      weight of aggregate
   a) 0.2 to 0.5%
   b) b) 0.5 to 1%
   c) c) 1 t0 2%
   d) d) 2 to 3%

3. Say true or false for the
following statement
   The absorption value not
varies with aggregate derived
from the sand,   stone and other
soft sand

4. In mix design calculation ,
the relative weight of the
aggregates are based on
the condition that the
aggregate are
   a) Saturated and surface
      dry
   b) b) Saturated and
      surface moisture
c) surface dry

d) surface moisture

5. The coarse aggregate sample
is immersed in water for------
hrs

6. Whether the following
statement is true or false:

The sample for water absorption test on coarse aggregate is washed to remove the fine particles and dust

7. The unit of water absorption of coarse aggregate is expressed in-------

8. The water absorption test is conducted as per I.S code------

9. Say true or false for the following statement
Indian Road congress has specified the maximum water absorption value as

1.0 percent for aggregates used in bituminous surface dressing

10. Separation of ingredients from concrete during transportation is called
   a) Bleeding   b) creep   c) Segregation d) Shrinkage

Answers:

1. d)
2. 2. b)
3. 3. False
4. 4. a)
5. 5. 24
6. 6. True
7. 7. %
8. IS: 2386 (Part III) – 1963

9. True

10 c)

1. Define stress?
2. Define strain?
3. Define hooks law?
4. Ratio of stress and strain within elastic limits is called_____?
5. Expand UTM & CTM?
6. Difference between mild steel and HYSD bars ?

7. Define Elasticity, Plasticity, Mealibilty, Ductility, Brittle?
8. Mode of failure for Mild steel?
9. What is necking?
10. IS code for tension test?
11. What is the units of stress?
12. What is the unit of young's modulus?
13. What is the unit of strain?
14. Young's modulus of mild steel is -_____?
15. Define modulus of elasticity?
16. Define yield stress, proof stress, ultimate stress, breaking stress,?
17. Define percentage elongation, percentage reduction of area?
18. Draw the Typical stress-strain curve for mild steel?
19. Identify the Important parameter located in the graph
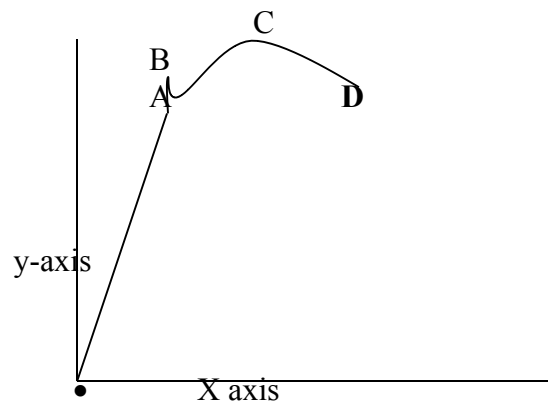
20. What is extensometer?
21. Difference between lateral strain and linear strain?

BULK DENSITY OF COARSE AGGREGATE

1. Define Bulk Density?
2. Bulk density of aggregate depends on _____
   a) Specific gravity   b) water content   c) compressive strength   d) voids
3. Unit of Bulk density _____
4. Define percentage of voids
5. IS code specified for the test of bulking of aggregate is_____

6. Where and Why Bulk density of aggregate is required in field application.
7. Define grading of aggregate
8. Define well graded aggregate
9. Define uniform graded aggregate
10. What is the significance of bulk density on concrete
11. Difference between bulk density and Density
12. Difference between bulk density and relative density
13.

SPECIFIC GRAVITY OF CEMENT

1. Specific gravity of the cement is tested with_____ a)water b)kerosene c) acid d) base
2. Specific gravity of OPC ranges from_____
3. Ratio of weight of the material to its weight of equal volume of water is called _____
4. Relationship between specific gravity and density?
5. Specificgravity of water is _____?
6. If specific gravity of cement is 3.15 then what is the specific gravity of cement taken on the moon _____?
7. Relation between specific gravity and specific weight?
8. Match the following
   a. Cement   2.1 to 2.35
   b. CA   1.91 to 2.41
   c. FA   2.5 to 2.85
   d. Fly ash   3.15to 3.36
                   4.5 to 5
9. Specific gravity of cement is is found as per code _____
10. Important parameter for designing heterogeneous material is _____
11. Unit of specifc gravity is_____ a)Gram b)Kg/cm c)meter   d) no unit
12. Why water is not used in finding specific gravity of cement?
13. Which constituent of cement react first with addition of water?

14. How do you determine specific gravity of cement?

Specific gravity of coarse aggregates

1. Average specific gravity of the rocks vary from,
   a) **2.6 to 2.8**
   b) 2.8 to 3.0
   c) 3.0 to 3.2
   d) 3.2 to 3.4
2. Specific gravity of Coarse Aggregate is made use of in design calculation of _____
   a) Concrete Mix Design
   b) Volume Determination
   c) Weight Determination
   d) **All of the above**
3. Apparatus used find out Specific Gravity of Coarse Aggregate
   a) Pycnometer
        c) Specific Gravity Bottle
   b) Density Bottle
        d)**Wire Basket**
4. Specific Gravity is an indicator of
   a) **How heavy a material is.**
   b) How lighter a material is
   c) How porous a material is
   d) How stronger material is
5. Specific gravity is the ratio of _____
6. Specific Gravity of aggregates ranges from
   a) 3.0 to 3.5   b) **2.5 to 3.0**
   b) 3.15 to 3.65   d) 2.0 to 2.5
7. Water Absorption of aggregates ranges from
   a) 0.5% to 1.6%
   b) 0.8% to 1.8%
   c) **0.1% to 2.0%**
   d) 1.0% to 3.0%
8. To what temperature the aggregates are kept in oven in case of Sp. Gravity test.
   a) 120^0C
   b) **110^0C**
   c) 95^0C
   d) 100^0C

9. For how much time the aggregates are kept in oven in case of Sp. Gravity test.
   e) 12hrs
   f) <u>24hrs</u>
   g) 18hrs
   h) 3hrs
10. Size of Wire Basket mesh should not exceed.
    a) 4.75mm
    c) 10mm
    b) **6.3mm**
    d) 2.36mm

Flakiness and Elongation Index

1. Apparatus used to perform flakiness test is?
   a) Length Gauge
   b) **Thickness Gauge**
   c) Meter Gauge
   d) Screw Gauge
2. Apparatus used to perform elongation test is?
   a) Meter Gauge
   b) **Length Gauge**
   c) Thickness Gauge
   d) Screw Gauge
3. Flakiness and Elongation test is not applicable to sizes,
   a) **Smaller than 6.3mm**
   b) Smaller than 10mm
   c) Smaller than 12.5mm
   d) Smaller than 4.75mm
4. Flaky and Elongated Particles are considered undesirable in pavement construction.
   a) **True**
   b) False
5. The flakiness index of the aggregates is the percentage by weight of particle whose least dimension is less than _____
   a) $2/5^{th}$ of their mean dimension
   b) $1/5^{th}$ of their mean dimension
   c) $4/5^{th}$ of their mean dimension
   d) **$3/5^{th}$ of their mean dimension**
6. The Elongation index of the aggregates is the percentage by weight of particle whose greatest dimension is greater than _____
   a) $1\frac{2}{5}$ of their mean dimension
   b) $2\frac{2}{5}$ of their mean dimension
   c) **$1\frac{4}{5}$ of their mean dimension**
   d) $2\frac{4}{5}$ of their mean dimension
7. The percentage by weight of particle whose least dimension is less than $3/5^{th}$ of their mean dimension is called as_____
   a) Angularity Number
      c)elongation index
   b) **flakiness index**
      d)none of the above

8. The percentage by weight of particle whose greatest dimension is greater than $1\frac{4}{5}^{th}$ of their mean dimension is called as_____
   a) Angularity Number
   b) **elongation index**
   c) flakiness index
   d) none of the above
9. Flakiness index is the percentage by weight of particles _____
   a) **Passed**
      c)Retained
   b) Neither a nor b
      d)none of the above
10. Elongation index is the percentage by weight of particles _____
    a) Passed
       c)Retained
    b) Neither a nor b
       d)none of the above
11. Flakiness and Elongation tests are categorized under_____
    a) Size Test
       c) Strength test
    b) **Shape Test**
       d) Durability test
12 Flakiness and Elongation is described under which IS Code:
    a) **IS 2386 part-I**
    b) IS 2386 part-II
    c) IS 2386 part-III
    d) IS 2386 part-IV
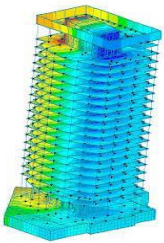
13 Aperture size of the smallest sieve used in Flakiness and Elongation test
   a) 6.3mm IS Sieve
   b) 4.75mm IS Sieve
   c) 2.36mm IS Sieve
   d) 1.18mm IS sieve

14 Aperture size of the Largest sieve used in Flakiness and Elongation test
   a) 80mm IS Sieve
   b) 70mm IS Sieve
   c) 63mm IS Sieve
   d) 50mm IS sieve

15 The particle shapes are determined by_____
   a) Sieve Analysis
   b) Flakiness and Angularity
   c) Elongation and Angularity
   d) Both b and c

1. In what way the values of impact energy will be influenced if the impact tests are conducted on two specimens, one having smooth surface and the other having scratches on the surface?
2. What is the effect of temp? On the values of rupture energy and notch impact strength?
3. What is resilience? How is it different from proof resilience and toughness?

4. What is the necessity of making a notch in impact test specimen?
5. If the sharpness of V-notch is more in one specimen than the other, what will be its effect on the test result?
1. The slump test is used to measure_____
2. What is the slump value of concrete for road work
   a) 20 to 30
   b)50 to 100
   c) 75 to 150
   d)12 to 25

3. What is the slump value of ordinary RCC work for beams and slabs

   a) 20 to 30
   b) 50 to 100
   c) 75 to 150   d) 12 to 25

4. Increase in slump may indicate

   a) Increase in moisture content of aggregate
   b) Change in grading of aggregate
   c) Both a and b

   d) None of the above

Course Title: **COMPUTER AIDED BUILDING PLANNING AND DRAWING**		
Credits (L:T:P) : **0:2:4**	Total Contact Hours: **78**	Course Code: **15CE46P**
Type of Course: **Practical**	Credit :**03**	Core/ Elective: **Core**
CIE- 25 Marks		SEE- 50 Marks

Pre-requisites: Knowledge of drafting software and Building Planning and Drawing.

Course Objective: Students are expected to prepare building plans, 3D drawings of buildings and to know the latest techniques in drafting software.

At the end of the course, the students will be able to

	Course Outcome	Experiments linked	**CL**	**Linked PO**	**Teaching Hrs**
CO1	Develop any type of building drawing using CADD software.	1,2,3 ,4,5,6,7	R/Ap/C	1,2,3,4, 5,8,9	40
CO2	Create layout plan, sanction drawings, working drawings using concept of layers.	8,9,10, 11,12,13	R/Ap/C	1,2,3,4, 5,6,8,9	20
CO3	Develop 3D model of building.	14,15	R/Ap/C	1,3,4, 8,9,10	15
CO4	Explore modern drafting tools in teams and prepare a report and able to present it	16	R/ Ap/Ay/C/E	1,2,3,4,6, 8,9,10	**03**
				Total sessions	**78**

Legend- R; Remember   U: Understand   Ap: Application   Ay: Analysis   C:Creation   E: Evaluation

	Programme Outcome									
Course	**PO1** Basic knowledge	**PO2** Discipline knowledge	**PO3** Experiments and	**PO4** Engineering Tools	**PO 5** Engineer and society	**PO6** Environment & Sustainability	**PO7** Ethics	**PO8** Individual and Team work	**PO9** Communication	**PO10** Life long learning
Computer Aided Building Planning And Drawing	3	3	3	3	3	2	-	3	3	1

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.
Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.
If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3
If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2
If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1
If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

COURSE CONTENT:

UNIT	EXERCISES	HOURS
1	**Preparation of Building Drawings**	40
	Given the line diagram, draw the plan, Section and elevation of the following types of buildings.	
	Experiment 1 — Residential Building with Dog Legged Stairs	
	Experiment 2 — Two storied residential building.	
	Experiment 3 — Primary School	
	Experiment 4 — Hostel Building.	
	Experiment 5 — Primary Health Centre	
	Experiment 6 — Small work shop building / Canteen Building / Bus station	
	Experiment 7 — Post office Building/Bank Building.	
2	**Preparation of working / Service Drawings**	20
	Preparation of service drawing for a same given residential building as layers.	
	Experiment 8 — Introduction to layers / Prepare Water supply layout & Sanitary Layout	
	Experiment 9 — Shallow well rain water harvesting &Solar water heater for terrace	
	Experiment 10 — Fire fighting layout for college building/commercial building	
	Experiment 11 — Preparation of a foundation Plan for residential building & framed structures.	
	Experiment 12 — Preparation of detailed plan and section of a Dog legged Stair case.	
	Experiment 13 — Preparation of Plan and Section of a Manhole and Septic tank with soak pit	
3	**Develop 3D Modelling of Buildings**	15
	Experiment 14 — Develop 3D model of a stair case.	
	Experiment 15 — Develop 3D model of a Residential Building / Public building from the given line diagram.	

UNIT		EXERCISES	HOURS
4	Experiment 16	**Suggested activities**	3
		Total	**78**

Course Delivery: The course will be delivered through lectures and Demonstration and CAD practices**.**

🎯 **SUGGESTED ACTIVITIES**

The topic should be related to the course in order to enhance his knowledge, practical skill, lifelong learning, communication and modern tool usage.

1. Visit any nearby public building and Draw a Layout Plan (Key plan) with building plan.
   a. PWD office
   b. Forest office
   c. Bank
   d. Post Office
   e. Hospital
   f. Police station
   g. Bus Stand
2. Prepare a foundation plan (Excavation Plan) for a multistoried building.
3. Search for ongoing layout plan collect the information of area distribution, building plans, Service drawings (water supply, sanitary, electrical and landscaping).
4. Space design of a Primary health centre using Circulation Diagram (Bubble diagram).
5. Space design of an Educational Building using Circulation Diagram (Bubble diagram).
6. Create an awareness program on rain water harvesting among your locality.
7. Choose a multistoried building and prepare a fire fighting layout.
8. Create a 3D building model by using any two software mentioned below and compare the utilities and limitations.
   a. Revit
   b. Google sketch up
   c. ArchiCAD
   d. 3DSMAX
   e. Blender
   f. QCAD
   g. Pythoncad
   h. CADEMIA

i.   ZWCAD
        j.   SKETCHBOARD
        k.   Sweethome 3D
        l.   ProgeCAD Smart!
        m.   Sculptris

NOTE:

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows: (Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good   **4**, Exemplary **5**)

2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary5				
1.Organisation	1				
2.Fulfill team's roles	4				
3.Conclusion	3				
4.Convensions	5				
Total	13				
Average=(Total /4)	3.25=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Course Assessment and Evaluation Scheme:

			To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Twice test (average of two tests)	Test 1	10	Blue books	CO1
					Test 2			CO2,CO3
				Record		10	CADD exercises	CO1,CO2,CO3
				Suggested Activity		05	Reports/Drawings	CO1,CO2,CO3,CO4
	SEE	End Exam		End of the course		50	Answer scripts at BTE	CO1,CO2,CO3,CO4
Indirect Assessment	Student Feedback on course		Students	Middle of the course		---	Feedback forms	CO1,CO2 Delivery of course
	End of Course Survey			End of the course		---	Questionnaires	CO1,CO2,CO3,CO4 Effectiveness of Delivery of instructions & Assessment Methods

CIE – Continuous Internal Evaluation   **SEE** – Semester End Examination

Note:
1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**15**
2	Applying the knowledge acquired from the course	**35**
3	Analysis	**5**
4	Synthesis (Creating new knowledge)	**40**
5	Evaluation	**5**

Sl No	Scheme of End Examination	Marks
1	Record & report on suggested activities	10
2	Preparation of Building drawings/3D drawings/ Preparation of Service or Working Drawings	30
3	Print out	5
4	Viva-voce	5
	Total	50

TEXT BOOKS

1. CAD in Civil Engineering a Laboratory Referrel- Dr M.A.Jayaram, D.S.Rajendra Prasad, Sapna Book House
2. Building Drawing – Shah M G, Tata McGraw – Hill, 1992.
3. Building Planning & Drawing – Kumaraswamy N., Kameswara Rao A., Charotar Publishing
4. Shah, Kale and Patki, Building Drawing with integrated approach to environment, Tata McGraw – Hill, 1992
5. Civil Engg. Drawing and House Planning – Verma B. P., Khanna Publishers, Delhi
6. Building Drawing & Detailing – Balagopal & T.S. Prabhu, Spades Publishers, Calicut
7. Building Planning and Drawing – S.S .Bhavikatti & M.V Chitawadagi, I.K International Publishing House Pvt.Ltd
8. National Building Code, BIS, New Delhi.

E-links

1. www.sketchup.com
2. www.autodesk.in/products/3ds-max/overview

Equipment List:

1. Computers with Latest Configuration. (One Computer per student in practical session.)
2. Any latest licensed Computer Aided Drafting Software.
3. Plotter of size A0
4. LCD Projector
5. UPS 5KVA
6. Furniture

	COURSE TITLE: HYDRAULICS AND ENVIRONMENTAL LAB		
	Credits (L:T:P) : **0:2:4**	Total Contact Hours: **78**	Course Code :15CE47P
	Type of Course Delivery: **Tutorial and Practice**	**Credit :03**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 50 Marks

Prerequisites: Basic knowledge of science and water supply engineering**.**

Course Objectives:
1. Exposure to the principles of Hydraulics in flow measurements.
2. Ability to critically observe/ examine and Measure the discharges through flow measuring devices.
3. Ability to critically examine the quality of water as per IS code of Practice.

Course Outcomes: (CO's)

On successful completion of this course, the student will be able to:

	Course Outcome	**CL**	**Linked experiments**	**Linked PO**	**Teaching Hrs**
CO1	Apply Bernoulli's equations in flow experiments to determine the coefficient of discharge.	*U/A*	1,2,3,4,5	1,2,3,4,5,6,8,10	**03**
CO1	Determine hydraulic coefficients of notches and orifices	*U/A*	1,2,3,4,5	1,2,3,4,5,6,8,10	**06**
CO3	Determine flow rates, pressure changes, and major head losses for viscous flows through pipes.	*U/A*	5,6	1,2,3,4,5,6,8,10	**06**
CO4	Assess physical characteristics of water as per BIS code of practice.	*U/A*	7,8,9,10	1,2,3,4,5,6,8,9,10	**03**
C05	Assess chemical characteristics of water as per BIS code of practice.	*U/A*	10,11,12,13,14,15,16	1,2,3,4,5,6,8,9,10	**48**
CO6	Apply techniques, skills developed for sustainable engineering solutions in environmental and societal context.	*U/A*	18	1,2,3,4,5,6,8,9,10	**12**
				Total sessions	**78**

COURSE-PO ATTAINMENT MATRIX

Mapping of COs with POs	PROGRAMME OUTCOME (PO)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic Knowledge	Discipline Knowledge	Experiments & practic	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Lifelong learning
Hydraulics and environmental lab	3	3	3	3	3	3	-	3	2	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.
Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

UNITS		HOURS
	Hydraulics Lab	
1	Determination of Coefficient of discharge for Rectangular Notch	3
2	Determination of Coefficient of discharge for Triangular Notch	3
3	Determination of Co-efficient of discharge for Trapezoidal Notch	3
4	Determination of Coefficient of discharge for Venturimeter.	3
5	Determination of Coefficient of discharge, Coefficient of contraction, and Coefficient of velocity for Circular Orifice.	3
6	Determination of Loss of Head due to Friction in Pipe line of different diameters.	3
	Water Analysis Lab	
7	Collection of Water Samples- Surface, Running and Ground water samples.	6
8	Determination of Turbidity of Water by Jackson turbidity meter / Nephelo Turbidity meter	6
9	Determination of Color of Water.	3
10	Determination of Total solids, Suspended Solids and Dissolved solids of water.	6
11	Determination of hardness- total hardness, Calcium and Magnesium Hardness, Permanent Hardness.	6
12	Determination of pH Value (pH meter method & pH paper) of water sample.	3
13	Determination of Alkalinity & acidity of water sample.	6
14	Determination of Chlorides of water sample.	3
15	Determination of Nitrates of water sample.	3
16	Determination of Calcium of water sample.	3
17	Tests	6
18	Field Visits to water treatment plant and sewerage treatment plant and preparation of Report and Presentation.	9
Total		**78**

1. Hydraulic Lab Manual Compiled – T.T.T.I. – Chennai – 113.
2. Ghosh and Talapohia– Experimental Hydraulic –Khanna Publishers –New Delhi
3. Central Public Health EnggOrganisation(CPHEO) water supply Manual
4. National environmental engineering Institute (NEERI) water supply manual
5. Water supply engineering by-Birdie
6. Water supply and sewage disposal by – S.K.Garg.
7. Water supply and sanitary engg. By –Rangawala.

SUGGESTED LIST OF STUDENT ACTIVITIES

Note: Following is the list of proposed student activities such as (5 marks for CIE)
Each student should submit Field visit report on any one of the following visits.

Sl No.	Student Activity
1	Visit to Water Treatment Plant
2	Visit to Sewerage Treatment Plant
3	Visit to a HOUSING Colony and Study of Water Supply and Sewerage System
4	Prepare/Download a dynamic animation to illustrate the following: • Working principle of hydraulic pumps. • Working of different types of hydraulic devices (applications). • Download the catalogue of Hydraulic devices. • Arrange visit to nearby Hydraulic equipment based industries.
5	Prepare reagents for conducting graded exercises.

Course Delivery:

The course will be delivered through lectures, Demonstration and practices.

Course Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Evidence Collected	Course Outcomes
Direct Assessment	CIE (Continuous Internal Evaluation)	I A Tests	Students	Two IA tests for Theory: (Average marks of Two Tests to be computed).	10	Blue Books	ALL CO's
		Graded Exercise Practice			10	Records	ALL CO's
		Field Visit/Student Activity		Field Visit/Student Activity	05	Log of Activity/Report on field visit	ALL CO's
				TOTAL	**25**		

SEE (Semester End Examination)	End Exam	Students	End Of the Course	50	Answer Scripts at BTE	ALL CO's
Indirect Assessment	Student Feedback on course	Students	Middle Of The Course	Feed Back Forms		All Cos Delivery of course
	End Of Course Survey		End Of The Course	Questionnaires		All Cos Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation   ***SEE** – Semester End Examination

Note:
1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's Category	% in Weightage
1	Remembering and Understanding	**30**
2	Applying the knowledge acquired from the course	**55**
3	Analysis	**07**
4	Evaluation	**55**
5	Creating new knowledge	**03**

Scheme of Valuation:

Sl no	Particulars	Marks
Hydraulics lab		
1	Writing Procedure /Formulae and Tabular column	05
2	Conduction of Experiment	15
Water Analysis Lab		
3	Writing Procedure /Formulae and Tabular column	05
4	Conduction of Experiment	15
5	Calculation and Result	05
6	Graded exercise + Suggested activity report	05
	Total Marks	50

List of equipments for Hydraulics lab:

1. Venturimeter with accessories.
2. Flow through notches apparatus with all accessories.
3. Flow through pipes (friction) apparatus with all accessories.

4. Piezometer with scale and tube.
5. Differential manometer set.
6. Orifice apparatus.

List of equipments for Water Analysis lab:

1. Spectrophotometer/colorimeter
2. Hot air Oven
3. Hot plate
4. Digital TDS meter for suspended solids
5. Electronic digital balance (1mg accuracy)
7. Digital turbidity meter
8. Digital PH meter
9. Water bath double walled
10. Porcelain dish
11. Dessiciator with accessories-2 lts capacity
12. Jackson turbidimeter
13. Nephelometer
14. Crucible, Burettes.
15. BOD bottles -250 ml
16. COD-Reflux apparatus
17. Volumetric flask   100ml.250ml,500ml
18. Reagent bottle-250 ml
19. Distillation kit
20. Beaker 100ml,250ml,500ml,1000ml
21. Funnel, Pipettes 5ml & 10ml(graduated)
22. Imhoff cone.

4ನೇ ಸೆಮಿಸ್ಟರ್-ಕನ್ನಡ ಕಲಿ-2 (ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಪರಿಚಯ)

4th Semester	Course: Kannada Kali-2	Course Code:15KA4NT (2016-17)
	No. of Credits:02	No. of teaching hours/week:02 No. of teaching hours/Semester:26
	Mode of Assessment and Evaluation: Semester End Examination (SEE)only. No CIE.	Maximum Marks: 50 (SEE only) Minimum Passing marks:20

ಉದ್ದೇಶ:

1. ಕೇಳುವುದು, ಗ್ರಹಿಸುವುದು, ನಿರರ್ಗಳವಾಗಿ ಮತ್ತು ಸ್ಪಷ್ಟವಾಗಿ ಓದುವ ಮತ್ತು ಮಾತನಾಡುವ (ಅಭಿವ್ಯಕ್ತಿಸುವ) ಸಾಮರ್ಥ್ಯವನ್ನು ಬೆಳೆಸುವುದು.
2. ಜ್ಞಾನಾರ್ಜನೆ, ಸಾಹಿತ್ಯಾಭಿರುಚಿ, ಚಿಂತನೆ ಮತ್ತು ಆನಂದಕ್ಕಾಗಿ ಸ್ವತಂತ್ರವಾಗಿ ಓದಲು, ಬರೆಯಲು ಮತ್ತು ಮಾತನಾಡಲು ಸಮರ್ಥರಾಗುವಂತೆ ಮಾಡುವುದು.
3. ಪದ ಸಂಪತ್ತನ್ನು ಹೆಚ್ಚಿಸಿಕೊಂಡು ಸ್ಪಷ್ಟ ಉಚ್ಚಾರಣೆಯೊಡನೆ ಲಿಖಿತ ಮತ್ತು ಮೌಖಿಕ ಚಟುವಟಿಕೆಗಳನ್ನು ಮಾಡಿಸಿ, ಸ್ವತಂತ್ರವಾಗಿ ಭಾಷೆಯ ಬಳಕೆ ಮಾಡುವುದು.
4. ನಾಡು-ನುಡಿ, ಸಂಸ್ಕೃತಿ ಮತ್ತು ಸಾಹಿತ್ಯಗಳ ಪರಿಚಯ ಮತ್ತು ಆತ್ಮೀಯ ಭಾವಾಭಿಮಾನವನ್ನು ಬೆಳೆಸುವುದು.
5. ಕ್ರಿಯಾತ್ಮಕ ಚಟುವಟಿಕೆಗಳಿಂದ ಭಾಷಾ ಕೌಶಲ್ಯದ ಸರಳ ಪ್ರಯೋಗ ಮಾಡಿಸುವುದು./ಕಲಿಸುವುದು.
(ಕ್ರಿಯಾತ್ಮಕ ಚಟುವಟಿಕೆ ಎಂದರೆ, ವರ್ಣಮಾಲೆ ಪರಿಚಯ, ವ್ಯಾಕರಣದ ಸರಳ ಪರಿಚಯ, ಗುಣಿತಾಕ್ಷರ, ಸಂಯುಕ್ತಾಕ್ಷರಗಳು, ನಾಮಪದ, ಲಿಂಗ, ವಚನ, ಪ್ರತ್ಯಯಗಳು, ವಾಕ್ಯರಚನೆ (ಕರ್ತೃ, ಕರ್ಮ, ಕ್ರಿಯಾಪದ) ಇತ್ಯಾದಿ).

Course outcome:
 1. Developing listening and speaking skills.
 2. Easy Interaction with peers.
 3. Students can use the language at ease in daily life situations

ಪಠ್ಯಕ್ರಮ ಮತ್ತು ಸರಳ ಭಾಷಾ ಕೌಶಲ್ಯ
(ಕನ್ನಡ ಕಲಿ-ಪಠ್ಯಪುಸ್ತಕ –ಶ್ರೀ ಲಿಂಗದೇವರು ಹಳೇಮನೆ – ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ ಪ್ರಕಾಶನ)

ಭಾಗ-2

ಪಾಠಗಳ ಕ್ರಮಾಂಕ Lesson No	ಪಠ್ಯವಸ್ತುವಿನ ವಿವರ – Curriculum Content	ಸೆಮಿಸ್ಟರ್ ಬೋಧನ ಆವಧಿ Total no.of Classes /Sem
Part-I		
11	Plan to go for a movie. Comparative, non-past tense, instrumental and ablative case	02
12	Conversation between Doctor & Patient. Potential forms, accusative case.	02
13	Enquiring about friend's family	02

14	Past tense -d, and -t- and -id-, negation.	
	Conversation between friends – Past tense –k – T – D and –id-v negation verbal noun	02
15	Routine activities of a Student.	01
16	About children's education. Continuous, Perfect tenses and negations.	02
17	Halebidu - Belur Relative participle, negation and Participle nouns.	02
18	Discussing about Examination and future plan-conditional and negative conditions.	03
19	Karnataka (Lesson for reading)(reading skill)	03
20	bEku bEDagaLu (Lesson for reading (Reading skill)	03
Part-II	Kannada Scripts	03
	ECA-word/sentence formation/letter/small essay writing	01
ಒಟ್ಟು ಗಂಟೆಗಳು		26

ಸೂಚನೆಗಳು:

- ಮೇಲಿನ ಪಾಠಗಳ ಪುನರಾವರ್ತಿತ ಭಾಗಗಳಿಗೆ ಬದಲಾಗಿ "ಕ್ರಿಯಾತ್ಮಕ ಚಟುವಟಿಕೆ"ಯಿಂದ ಗಳಿಸುವ ಅಕ್ಷರ ಜ್ಞಾನ ದಿಂದ ಪದ ಸಂಪತ್ತು ಹೆಚ್ಚಿಸಿ, ಪದಗಳಿಂದ ಸ್ವಂತ ವಾಕ್ಯಗಳ ರಚನೆ ಮಾಡಿಸುವುದು. (ಅಮ್ಮ, ಮೊಬೈಲ್, ಕನ್ನಡ ಭಾಷೆ, ಕವಿಗಳು, ನಾಟಕ, ಜನಪದ ಕಲೆ, ನಾಡಿನ ಪ್ರಸಿದ್ಧ ವ್ಯಕ್ತಿಗಳು, ಸಹೋದರ, ಸ್ನೇಹಿತ, ತರಕಾರಿ, ದೋಸೆ, ತಿಂಡಿ, ನಿದ್ದೆ, ಬಿಸಿ, ಚಳಿ, ಆಕಾಶ, ಓದು, ಇತ್ಯಾದಿ ನಿತ್ಯ ಬಳಕೆಯ ಸರಳ ಪದಗಳಿಂದ ವಾಕ್ಯರಚನೆ ಮತ್ತು 25–50 ಪದಗಳ ಕಿರು ಪ್ರಬಂಧ ರೂಪದ ಲೇಖನ ರಚನೆ).

- ಸಂಸ್ಥೆಯ ಪ್ರಾಚಾರ್ಯರಿಗೆ ವಿದ್ಯಾರ್ಥಿಯ ಮನವಿ ಪತ್ರ, ಕುಂದುಕೊರತೆಗಳ ಬಗ್ಗೆ ಸಂಬಂಧಿಸಿದವರಿಗೆ ಪತ್ರ, ಸ್ನೇಹಿತರಿಗೆ ಪತ್ರಗಳು, ಸರಳವಾಗಿ ಯಾವುದೇ ಸಾಮಾನ್ಯ ವಿಷಯಗಳ ಬಗ್ಗೆ ಪತ್ರಲೇಖನ. (6–10 ವಾಕ್ಯಗಳು).

ಆಕರ ಗ್ರಂಥಗಳು:

1. ಕನ್ನಡ ಕಲಿ–ಶ್ರೀ ಲಿಂಗದೇವರು ಹಳೇಮನೆ – ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
2. ಪ್ರಾಥಮಿಕ ಶಾಲೆಯ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕಗಳು
3. ಸರಳ ಕನ್ನಡ ವ್ಯಾಕರಣ ಪುಸ್ತಕಗಳು– ಎಂ.ವಿ ನಾಗರಾಜರಾವ್/ಇತರೆ ಲೇಖಕರು.
4. ಪ್ರಯೋಗ ಪ್ರಣತಿ–ಪ್ರಥಮ ಪಿಯುಸಿ ಪೂರಕ ಪಠ್ಯ.
5. ಸರಳ ಪತ್ರವ್ಯವಹಾರದ ಪುಸ್ತಕಗಳು

ಡಿಪ್ಲೋಮಾ 4ನೇ ಸೆಮಿಸ್ಟರ್–*ಕನ್ನಡ ಕಲಿ–2 (ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಪರಿಚಯ)*

ಸೆಮಿಸ್ಟರ್ ಅಂತಿಮ ಲಿಖಿತ ಪರೀಕ್ಷೆ

ಸಮಯ: 2 ಗಂಟೆಗಳು   ಗರಿಷ್ಠ ಅಂಕಗಳು:50
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1. Fill in the blanks using the appropriate words.

2. Rewrite as directed.

3. Combine the following sentences.

4. Translate into Kannada.

5. Answer the following questions.

6. Fill in the blanks using the correct past tense forms of the verbs giving in the bracket.

7. Transform into negative.

8. Substitute and complete the sentence

9. Vocabulary (meanings of words) using formation of sentences (any five).

10. Questions from lessons 17 to 19. (Out of 6 questions, answer any 3 questions).

11. Scripts- consonants form- +vowel (10 types)

12. Conversation & other questions. (KK-Exercises)

ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ:

ಡಿಪ್ಲೋಮಾ 4ನೇ ಸೆಮಿಸ್ಟರ್–*ಕನ್ನಡ ಕಲಿ–2 (ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಪರಿಚಯ)*

ಸೆಮಿಸ್ಟರ್ ಅಂತಿಮ ಲಿಖಿತ ಪರೀಕ್ಷೆ

ಸಮಯ: 2 ಗಂಟೆಗಳು   ಗರಿಷ್ಠ ಅಂಕಗಳು:50

I.   (a) Fill in the blank using the correct past tense forms of the verbs given in the bracket.   3+2 =05
        1.ಅವರು ನಿನ್ನೆ ಊರಿನಿಂದ ....   (ಬಾ)
        2. ಅವಳು ಒಂದು ಹೆಣ್ಣ ಮಗು ....   (ಹೆರು)
        3.ನಾನು ನಿನಗಾಗಿ ತುಂಬಾ ಹೊತ್ತು...............   (ಕಾಯು)

        (b) Fill in the blank using the correct verbal participle forms of the verbs given in
        the bracket.
        1.ಆ ಹುಡುಗಿ ಮನೆ .... ಹೋದಳು. (ಬಿಡು)
        2. ಅವನು ಇವತ್ತ ಊರಿನಿಂದ.............ನಾಳೆ ಬರುತ್ತಾನೆ. (ಹೊರಡು)

II. Give the negative forms of the following sentence.   (Any Five)   1X5=05

    ಅ) ನೀವು ಪುಸ್ತಕ ಕೊಡಿ.

    ಆ) ನೀವು ಸಿಗರೇಟ್ ಸೇದಬಹುದು.

    ಇ) ಅವರು ನನಗೆ ಚೆನ್ನಾಗಿ ಗೊತ್ತು.

    ಈ) ಅವರು ಕನ್ನಡ ಚೆನ್ನಾಗಿ ಕಲಿತರು.

    ಉ) ಅವಳು ತಲೆ ಬಾಚಿಕೊಂಡು ಬಂದಳು.

    ಊ) ಅವನಿಗೆ ಫೋನ್ ಬಂದಿದೆ.

    ಎ) ರವಿ ಮನೆಯಲ್ಲಿ ಮಲಗಿರ್ತಾನೆ.

III. Translate into KANNADA. (Any Five)   2X5=10

    1) Who will come with you?
    2) Today Ms. Kamala will go to her native place.
    3) You must drink butter milk daily.
    4) Please, don't talk to me.

5) How much advance money did you pay for the hostel?
6) How many of you are learning Kannada seriously?
7) If I get good marks in diploma, I will get admission for BE program.
8) At what time today you will be available in the hostel?.

IV. Vocabulary.

(a) Write English equivalents of the Kannada words. (Any five)   1X5=05

1. ಆಗಸ 2. ಶೈಲಿ 3. ಅನುಮಾನ 4.ಪರೀಕ್ಷೆ   5.ಜಾತಿ   6.ನೈಸರ್ಗಿಕ 7.ಮತ 8. ವಾಣಿಜ್ಯ

(b) Write Kannada equivalents of the English words.   (Any five)   1X5=05

1. Wealth 2. Religion 3. Memory 4.fear 5.Environment 6. Primary 7. Mistakes 8. Tall

VI. Conversation:

ಈ ಕೆಳಗಿನ ಅಪೂರ್ಣ ಸಂಭಾಷಣೆಯನ್ನು ಆವರಣದಲ್ಲಿ (bracket) ನೀಡಿರುವ ಪದಗಳನ್ನು ಅರ್ಥಮಾಡಿಕೊಂಡು ಪೂರ್ತಿ ಮಾಡಿ.   −05

ರಾಜು: ನಿನಗೆ ನಿನ್ನೆ ಮೋಹನ್ ಸಿಕ್ಕನಾ?
ರಾಮು: .... negative)   ನಿನಗೆ ಸಿಕ್ಕನಾ?
ರಾಜು .... (Positive) ಹೌದು, ನಿಮ್ಮನ್ನು ನೋಡುವುದಕ್ಕೆ ಹೋಗುತ್ತೇನಿ ಅಂತ ಹೇಳಿದ.
ರಾಮು: .... (Enquiring about meeting him)
ರಾಜು:   ಅವನು ಕೆಲಸ ಬಿಟ್ಟನಂತೆ.
ರಾಮು: .... (Questioning)
ರಾಜು: ....(Answer).

VII.Transform the following sentences as per direction. (Any Five)   1X5=05

1. ಮಕ್ಕಳು ರಸ್ತೆಯಲ್ಲಿ ಆಟ ಅಡ್ತಾ (into present continuous)   ಇದ್ದವು.
2. ಹುಡುಗರು ತರಗತಿಯಲ್ಲಿ ಸುಮ್ಮನೆ (into present continuous) ನಗ್ತಾ ಇದ್ದರು.
3. ಆ ಹೆಂಗಸರು ಜಗಳ ಆಡ್ತಾ ಇದ್ದಾರೆ. (into past continuous)
4. ತರಕಾರಿ ಕಡಿಮೆ ಬೆಲೆಗೆ ಸಿಗ್ತಾ ಇದೆ. (into past continuous)
5. ಅವನು ದಿನಾ ಇಲ್ಲಿಗೆ ಬರ್ತಾನೆ.   (into habitual)
6. ಇಲ್ಲಿ ಬಸ್ಸುಗಳು ತುಂಬಾ ಓಡಾಡ್ತ (into habitual) ಇವೆ.
7. ಆಂಧ್ರಪ್ರದೇಶದಿಂದ ಬಂದಿದ್ದ ವಿದ್ಯಾರ್ಥಿಗಳು ಎಲ್ಲಿದ್ದಾರೆ?(into present perfect)

VIII.Write the Kannada alphabet in the traditional order.   05

OR

ಹಳೇಬೀಡು ಬೇಲೂರಿನಿಂದ ಎಷ್ಟು ದೂರದಲ್ಲಿದೆ ಮತ್ತು ಯಾವ ಜಿಲ್ಲೆಯಲ್ಲಿದೆ? ಇಲ್ಲಿನ ದೇವಸ್ಥಾನಗಳ ಹೆಸರುಗಳು ಏನು ಮತ್ತು ಅವುಗಳನ್ನು ಕಟ್ಟಿಸಿದವರು ಯಾರು?
IX. Combine the following: (Any One)   1X1=01

(A) 1) ಮನೆ + ಇಂದ   =
    2) ಮ್ + ಔ   =

(B) Combine the following sentence using verbal participle form. (Any One)   1X1=01

ಅ) ಹುಡುಗರು ದುಡ್ಡು ಕೊಟ್ಟರು.
   ಹುಡುಗರು ಸರ್ಕಸ್ ನೋಡಿದರು.
ಆ) ನಾನು ಕೆಲಸ ಮಾಡ್ತಾ ಇದ್ದೆ.
   ನಾನು ಎಂ.ಎ. ಓದಿದೆ.

(B) Frame meaningful small sentences with using words given given below:(Any Three) -1X3=03.
ಅ) ಮರ   ಆ) ಫಲ   ಇ) ಊರು   ಈ) ಪೇಪರ್   ಉ) ಇವರು   ಊ) ಮನೆ ಎ) ಶಾಲೆ

ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ ರಚನಾ ಸಮಿತಿ

- **ಸಂಪಾದಕೀಯ ಸಮಿತಿ:**

1. ಶ್ರೀ ಟಿ ಎಲ್ ರವೀಂದ್ರ, ಉಪನ್ಯಾಸಕರು, ಸರ್ಕಾರಿ ಜಿ.ಆರ್.ಐ.ಸಿ.ಪಿ ಬೆಂಗಳೂರು.
2. ಶ್ರೀ ಟಿ. ತಿಮ್ಮಪ್ಪ, ಉಪನ್ಯಾಸಕರು(ಆಯ್ಕೆ ಶ್ರೇಣಿ), ಯಾಂತ್ರಿಕ ವಿಭಾಗ, ಸರ್ಕಾರಿ ಪಾಲಿಟೆಕ್ನಿಕ್, ತುಮಕೂರು.

- **ಸಲಹಾ ಸಮಿತಿಯ ಬಾಹ್ಯ ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳು.**

1. ಪ್ರೊ. (ಡಾ.) ಡಿ. ಪಾಂಡುರಂಗ ಬಾಬು, ಕುಲಸಚಿವರು, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
2. ಪ್ರೊ. (ಡಾ.) ಅಶೋಕ್ ಕುಮಾರ್ ರಂಜರೆ, ಪ್ರಾಧ್ಯಾಪಕರು, ಪ್ರಸಾರಾಂಗ ವಿಭಾಗ,
   ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
3. ಪ್ರೊ. (ಡಾ.) ಕೆ ವೈ ನಾರಾಯಣ ಸ್ವಾಮಿ, ಸಹ ಪ್ರಾಧ್ಯಾಪಕರು, ಸ್ನಾತಕೋತ್ತರ ವಿಭಾಗ,
   ಸರ್ಕಾರಿ ಕಲಾ ಕಾಲೇಜು, ಬೆಂಗಳೂರು.
4. ಪ್ರೊ. (ಡಾ.) ಜೆ ಬಾಲಕೃಷ್ಣ, ಪ್ರಾಧ್ಯಾಪಕರು ಹಾಗು ಮುಖ್ಯಸ್ಥರು, ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ವಿಭಾಗ,
   ಕೃಷಿ ವಿಶ್ವವಿದ್ಯಾಲಯ, (ಜಿಕೆವಿಕೆ) ಹೆಬ್ಬಾಳ, ಬೆಂಗಳೂರು.

		KARNATAKA STATE BOARD OF TECHNICAL EXAMINATION, BENGALURU.											
		TEACHING AND EXAMINATION SCHEME FOR KANNADA COURSE IN DIPLOMA PROGRAME											
SEMESTER: III			COMMON TO ALL DIPLOMA PROGRAMMES									C-15 Curriculum	
SL.N0	COURSE NAME	Teaching Department	COURSE /QP CODE	Teaching scheme					Examination scheme					
				Contact hours									
				TH	TU	PR	TOTAL	Credit	Exam paper duration in Hrs	End exam		Maximum CIE Marks (IA+SA)	Minimum Marks for passing. (IA + SA)
										Max marks	Min marks		
	THEORY												
1	KANNADA KALI-1	KA	15KA3NT	2	-	-	2	2	-	-	-	-	50	20
2	TANTRIKA KANNADA -1	KA	15KA3KT	2	-	-	2	2	-	-	-	-	50	20

CIE- Continuous Internal Examination: SEE-Semester End Examination: IA-Internal Assessment Tests: SA- Student Activity.

Note: 1. Candidates studied Kannada as one subject in 10th standard shall take Tantrika Kannada 1 &2. Others may take "Kannada Kali-1&2".

2. In 3rd Semester- Assessment is only by CIE and no SEE. Average marks of three I A tests shall be rounded off to the next higher digit. Rubrics to be devised appropriately to assess student activity.

		KARNATAKA STATE BOARD OF TECHNICAL EXAMINATION, BENGALURU.											
		TEACHING AND EXAMINATION SCHEME FOR KANNADA COURSE IN DIPLOMA PROGRAME											
SEMESTER: IV			COMMON TO ALL DIPLOMA PROGRAMMES									C-15 Curriculum	
SL.N0	COURSE NAME	Teaching Department	COURSE /QP CODE	Teaching scheme					Examination scheme					
				Contact hours									
				TH	TU	PR	TOTAL	Credit	Exam paper duration in Hrs	Sem End Exam		Maximum CIE Marks (IA+SA)	Minimum Marks for passing. (IA + SA)
										Max Exam Marks	Min Passing Marks		
	THEORY												
1	KANNADA KALI-2	KA	15KA4NT	2	-	-	2	2	2	50	20	-	-
2	TANTRIKA KANNADA -2	KA	15KA4KT	2	-	-	2	2	2	50	20	-	-

CIE- Continuous Internal Examination: SEE-Semester End Examination: IA-Internal Assessment Tests: SA- Student Activity.

Note: In 4th Semester- Assessment is only by SEE and no CIE. To award diploma certificate, passing in Kannada course is mandatory. However Kannada course is not included in the eligibility criteria for promotion to the higher semester.

4ನೇ ಸೆಮಿಸ್ಟರ್ – ತಾಂತ್ರಿಕ ಕನ್ನಡ –2 (ಸಾಹಿತ್ಯ ಮತ್ತು ಭಾಷಾ ಕೌಶಲ್ಯ ಪ್ರಯೋಗ)
ಪಠ್ಯಕ್ರಮ

4th Semester	Course: ತಾಂತ್ರಿಕ ಕನ್ನಡ –2	Course Code:15KA4KT (2016-17)
	No. of Credits:02	No. of teaching hours/week:02 No. of teaching hours/Semester:26
	Mode of Assessment and Evaluation: Semester End Examination (SEE)only. No CIE.	Maximum Marks: 50 (SEE only) Minimum Passing marks:20

ಪಠ್ಯ ಪ್ರಕಾರ	ಪಾಠ	ಪಠ್ಯದ ಹೆಸರು/ಲೇಖಕರು/ಪ್ರಕಟಣೆ	ಸೆಮಿಸ್ಟರ್ ಬೋಧನಾವಧಿ ಗಂಟೆಗಳು
ಕಾವ್ಯ ಮಂಜರಿ–(ಬದುಕು ಮತ್ತು ಮಾನವತೆ)	1	(ಕಾವ್ಯ ಗುಚ್ಛಗಳು) (1) ನನ್ನ ಹಣತೆ–ಡಾ:ಜಿ.ಎಸ್.ಎಸ್. (2) ಮಂಕು ತಿಮ್ಮನ ಕಗ್ಗ–ಡಿ.ವಿ.ಜಿ	02
ಸಂಸ್ಕೃತಿ	2	ಅಲೆಕ್ಸಾಂಡರ್ನ ಗುರುದಕ್ಷಿಣೆ–ಮಾಸ್ತಿ ವೆಂಕಟೇಶ ಅಯ್ಯಂಗಾರ್	02
ಪರಿಸರ/ಸಾಹಸ	3	ವೈನಾಡಿನ ನರಭಕ್ಷಕರು – ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ	02
ಕ್ರೀಡೆ/ಕಲೆ	4	ಜಿ.ಆರ್.ವಿಶ್ವನಾಥ್–ಡಾ: ಕ.ಪುಟ್ಟಸ್ವಾಮಿ	02
ತಂತ್ರಜ್ಞಾನ	5	ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ–ಒಂದು ಸ್ಥೂಲ ನೋಟ–ಜಿ.ಎನ್.ನರಸಿಂಹಮೂರ್ತಿ	02
ಯಶೋಗಾಥೆ/ವ್ಯಕ್ತಿಚಿತ್ರಣ	6	ಡಾ:ವಿಶ್ವೇಶ್ವರಯ್ಯ–ವ್ಯಕ್ತಿ ಮತ್ತು ಇತಿಹ್ಯ – ಎ.ಎನ್.ಮೂರ್ತಿರಾವ್	02
ಭಾಷಾ ಕೌಶಲ್ಯ–ಚಟುವಟಿಕೆಗಳು	7	ಲಿಖಿತ ಅಭಿವ್ಯಕ್ತಿ: ಪತ್ರಗಳ ರಚನೆ–ವ್ಯಾಪ್ತಿ: ಪತ್ರದ ಭಾಷೆ, ಶೈಲಿ, ನಮೂನೆಗಳು (1) ವೈಯಕ್ತಿಕ ಪತ್ರ (ಪ್ರವಾಸ/ಕೋರಿಕೆ.(ಮನವಿ/ಆತ್ಮಿಯರಿಗೆ ಬರೆಯುವ ಪತ್ರಗಳು)..) (2) ಪತ್ರ ವ್ಯವಹಾರ (ವಾಣಿಜ್ಯ ಸಂಸ್ಥೆಗಳಿಗೆ ಬರೆಯುವ/ಪ್ರತ್ಯುತ್ತರ ಪಡೆಯುವ, ಬ್ಯಾಂಕ್ಗಳಿಗೆ/ಸರ್ಕಾರಿ ಕಚೇರಿಗಳಿಗೆ ಬರೆಯುವ ಪತ್ರಗಳು....)–ಮಾದರಿಗಳು (3) ಅಭ್ಯರ್ಥನ ಪತ್ರ (ಹುದ್ದೆಗೆ ಅರ್ಜಿ) –1–2 ನಮೂನೆಗಳು–4–5 ಪ್ರಶ್ನೆಗಳು (4) ಓದುಗರ ವಿಭಾಗಕ್ಕೆ ಪತ್ರಿಕಾ ಸಂಪಾದಕರಿಗೆ ಬರೆಯುವ ಪತ್ರಗಳು 1 ನಮೂನೆ–3–4 ವಿಷಯಗಳ ಮೇಲೆ ಪತ್ರ ಬರೆಸುವುದು.	06
	8	ಸಂಕ್ಷಿಪ್ತ ಲೇಖನ (ಸಾರಾಂಶ ಲೇಖನ)	02
	9	ಮೌಖಿಕ ಅಭಿವ್ಯಕ್ತಿ> ಚರ್ಚಾ ಸ್ಪರ್ಧೆ/ಕೂಟ–ಭಾಷಣ–ಆಶುಭಾಷಣ –ಕಾರ್ಯಕ್ರಮ ನಿರೂಪಣೆ ಮಾಡುವುದು.	06
		ಒಟ್ಟು ಅವಧಿ	26 ಗಂಟೆಗಳು

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ಡಿಪ್ಲೋಮಾ 4ನೇ ಸೆಮಿಸ್ಟರ್ (ಕನ್ನಡಬಲ್ಲ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ)

ತಾಂತ್ರಿಕ ಕನ್ನಡ–2

ಪರಿವಿಡಿ

</div>

ಭಾಗ–1

ಕಾವ್ಯ ಗುಚ್ಛ

1. ನನ್ನ ಹಣತೆ–ಡಾ:ಜಿ.ಎಸ್.ಶಿವರುದ್ರಪ್ಪ
2. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ–ಡಿವಿಜಿ

ಗದ್ಯ ಸಾಹಿತ್ಯ

3. ಅಲೆಕ್ಸಾಂಡರನ ಗುರುದಕ್ಷಿಣೆ (ಸಂಸ್ಕೃತಿ–ಕತೆ)–ಶ್ರೀನಿವಾಸ (ಮಾಸ್ತಿ)
4. ವೈನಾಡಿನ ನರಭಕ್ಷಕರು (ಪರಿಸರ–ಸಾಹಸ)–ಕೆ.ಪಿ.ಪೂ.ತೇಜಸ್ವಿ
5. ಲಿಟ್ಲಲ್ ಮಾಸ್ಟರ್ (ಕ್ರೀಡೆ/ಕಲೆ)–ಡಾ.ಕೆ.ಪುಟ್ಟಸ್ವಾಮಿ
6. ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ–ಜಿ.ಎನ್.ನರಸಿಂಹಮೂರ್ತಿ
7. ಡಾ:ವಿಶ್ವೇಶ್ವರಯ್ಯ–ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ–ಎ.ಎನ್.ಮೂರ್ತಿರಾವ್

ಭಾಗ–2   –ಭಾಷಾ ಕೌಶಲ್ಯ ಚಟುವಟಿಕೆಗಳು

(1)ಬರಹ ರೂಪದ ಸಂವಹನ ಕನ್ನಡ–ಅಭಿವ್ಯಕ್ತಿಯ ಸ್ವರೂಪ

ಔಪಚಾರಿಕ ಮತ್ತು ಅನೌಪಚಾರಿಕ ಪತ್ರಗಳು

(ಅ) ಪತ್ರವ್ಯವಹಾರ–ವ್ಯಾಖ್ಯೆ–ವಿವರಣೆ

(ಆ) ಪತ್ರಗಳ ಮಾದರಿಗಳು

1. ವಾಣಿಜ್ಯ ಪತ್ರಗಳು–ವ್ಯಾಖ್ಯೆ, ಕೆಲವು ವಿಧಗಗಳು

2. ಖಾಸಗಿ/ವೈಯಕ್ತಿಕ ಪತ್ರಗಳು

3. ಪತ್ರಿಕೆಗಳಿಗೆ ಬರೆಯುವ (ಓದುಗರ)ಪತ್ರಗಳು

4. ಅಭ್ಯರ್ಥನ ಪತ್ರಗಳು

(2) ಸಾರಾಂಶ ಲೇಖನ: ವ್ಯಾಖ್ಯೆ, ಉದ್ದೇಶ, ವಿಧಾನಗಳು.

3 . ಮೌಖಿಕ ಅಭಿವ್ಯಕ್ತಿ ಚಟುವಟಿಕೆಗಳು(ತರಗತಿ ಚಟುವಟಿಕೆಗಳು)

1. ವಿಷಯಾತ್ಮಕ ಭಾಷಣಗಳು

2. ಆಶುಭಾಷಣ (ರಚನಾತ್ಮಕ ವಿಷಯಗಳು)

3. ಚರ್ಚೆ (ವಿಚಾರ ವಿನಿಮಯ/ಪರ–ವಿರುದ್ಧ ವಾದ ಮಂಡನೆ)

4. ನಿರೂಪಣೆ

Course outcome:
 1. Developing listening and speaking skills.
 2. Easy Interaction with peers.
 3. Students can use the language at ease in daily life situations

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ಡಿಪ್ಲೋಮಾ ನಾಲ್ಕನೇ ಸೆಮಿಸ್ಟರ್ (ಕನ್ನಡ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ)

ತಾಂತ್ರಿಕ ಕನ್ನಡ–2

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ಸಮಯ: **2.00** ಗಂಟೆ   ಅಂಕಗಳು: 50

I. ಕೆಳಗಿನ ಯಾವುದೇ **ಐದು** ಪ್ರಶ್ನೆಗಳಿಗೆ 1–2 **ಪೂರ್ಣ** ವಾಕ್ಯಗಳಲ್ಲಿ ಉತ್ತರಿಸಿ.   1X5=05
  (1) ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನದ ಮಾಹಿತಿಯನ್ನು ನಷ್ಟಗೊಳಿಸುವ ಅನಿಷ್ಟ ಯಾವುದು?
  (2) ದಿವಾನ್ ಪದವಿ ಬಂದಾಗ ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ತಮ್ಮ ತಾಯಿಗೆ ಹೇಳಿದ ಮಾತೇನು?
  (3) ಅರಿಸ್ಟಾಟಲ್ ಯಾರು ಮತ್ತು ಅವರು ಅಲೆಕ್ಸಾಂಡರನಿಗೆ ಏನಾಗಬೇಕು?
  (4) ಸುತ್ತೋಲೆ ಅಥವ ಪರಿಪತ್ರ ಎಂದರೇನು?
  (5) ಫಿನಿಕ್ಸ್ ಎಂದರೇನು?
  (6) 'ಖಡ್ಗ' ಎಂದರೇನು?
  (7) ನಿರೂಪಕರೆಂದರೆ ಯಾರು?

II. ಕೆಳಗಿನ ಯಾವುದೇ **ಮೂರು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಸಂಕ್ಷಿಪ್ತವಾಗಿ ಉತ್ತರಿಸಿ.   5X3=15

  (1) ಕವಿ "ಹಣತೆ ಹಚ್ಚುತ್ತೇನೆ ನಾನು' ಎಂದು ಏಕೆ ಹೇಳುತ್ತಾರೆ?
  (2) ಕ್ಲಿಯಾಂತಸನ ಸಾವು
  (3) ಕಾಕನಕೋಟೆ ಕಾಡು ಹೇಗಿದೆ?
  (4) ಅಂತರಜಾಲದ ಉಪಯೋಗಗಳು.
  (5) ಅನೌಪಚಾರಿಕ ಅಭಿವ್ಯಕ್ತಿ ಎಂದರೇನು ತಿಳಿಸಿ.
  (6) ಚರ್ಚಿ – ವ್ಯಾಖ್ಯೆ ಮತ್ತು ಉಪಯೋಗದ ಬಗ್ಗೆ ಬರೆಯಿರಿ.

III .ಈ ಕೆಳಗಿನ ಯಾವುದೇ **ಮೂರು** ಪ್ರಶ್ನೆಗಳಿಗೆ ವಿವರಣಾತ್ಮಕ ಉತ್ತರ ಬರೆಯಿರಿ.   10X3=30
(ಅ)   ಹುಲ್ಲಾಗು ಬೆಟ್ಟದಡಿ...... ಕಗ್ಗದಲ್ಲಿ ಮನುಷ್ಯ ಏನಾಗಬೇಕೆಂದು ಮತ್ತು ಸಂಗೀತ ಕಲೆಯೊಂದು ಸಾಹಿತ್ಯ   ಕಲೆಯೊಂದು...." ಕಗ್ಗದಲ್ಲಿ ಕವಿ ಇವೆಲ್ಲ ಮನುಷ್ಯನಿಗೆ ಏಕೆ ಬೇಕೆಂದು ಹೇಳುತ್ತಾರೆ?
(ಆ) ಅಣ್ಣನನ್ನು ಕಾಪಾಡಲು ಯೋಗ ಮಾಡಿದ ಸಾಹಸವನ್ನು ವಿವರಿಸಿ.
       (ಅಥವ)
       ಅತಿಯಾದ ನಗರೀಕರಣಕ್ಕಾಗಿ ಕಾಡುಗಳ ನಾಶದಿಂದ ಪರಿಸರದ ಮೇಲಾಗುವ ಪರಿಣಾಮಗಳ ಬಗ್ಗೆ   ಬರೆಯಿರಿ.
 (ಇ) ನೀವು ಕಾಲೇಜಿನಿಂದ ಹೋಗಿಬಂದ ಪ್ರವಾಸದ ಅನುಭವ ಕುರಿತು ನಿಮ್ಮ ಗೆಳೆಯರಿಗೆ ಪತ್ರ ಬರೆಯಿರಿ.
(ಈ) ಕೆಳಗಿನ ವಿಷಯವನ್ನು ಒಂದು ಸೂಕ್ತ ಶೀರ್ಷಿಕೆ ಸಹಿತ 30 ಪದಗಳ ಮಿತಿಯಲ್ಲಿ **ಸಂಕ್ಷೇಪಗೊಳಿ**ಸಿ.

       ನೀಲಾಂಬರ ದ್ವೀಪ. ಇದೊಂದು ಸುಂದರ ದ್ವೀಪ. ಪ್ರವಾಸಿಗಳಿಗೆ ಸ್ವರ್ಗಸಮಾನ ದ್ವೀಪ. ಈ ದ್ವೀಪ ಹಿಂದೂ ಮಹಾಸಾಗರದ ದಕ್ಷಿಣಕ್ಕಿರುವ ಆರು ದ್ವೀಪ ಸಮೂಹದಲ್ಲಿ ಮಧ್ಯದಲ್ಲಿ ಹುಣ್ಣಿಮೆ ಚಂದ್ರನಂತೆ ಕಂಗೊಳಿಸುತ್ತಿರುವ ದೊಡ್ಡ ದ್ವೀಪ. ಈ ದ್ವೀಪ ಒಂದು ಭಾಗದಲ್ಲಿ ಹಸಿರು ಚಾದರ ಹಾಸಿದಂತೆ ಸಮತಟ್ಟಾದ ಹುಲ್ಲುಗಾವಲು. ಇನ್ನೊಂದ' ಪಕ್ಕ ಬಗೆಬಗೆಯ ಹಣ್ಣುಗಳ ಮತ್ತು ಹೂವುಗಳ ಗಿಡಗಳು ಮತ್ತು ಅಡಿಕೆ, ಮಾವು, ಮೆಣಸು, ಏಲಕ್ಕಿ, ಲವಂಗದಂತಹ ಗಿಡ–ಮರಗಳಿಂದ ಕೂಡಿದೆ.ಈ ದ್ವೀಪದ ಮಧ್ಯೆ ಕಿರೀಟದಂತೆ ನಮ್ಮ ಉದಕಮಂಡಲದಂತಿರುವ ಹಸಿರಿನ ಬೆಟ್ಟ, ನಿಸರ್ಗದತ್ತ ಹೂವುಗಳ ಗಿಡಗಳಿಂದ ಪುಷ್ಪೋದ್ಯಾನದಂತಿದೆ. ಪ್ರಕೃತಿಯೇ ನಿರ್ಮಿಸಿರುವ ತಿಳಿನೀರಿನ ಸುಂದರ ಕೊಳ ಈ ಬೆಟ್ಟದ

ಆಕರ್ಷಣೆಯಾಗಿದೆ. ಹೀಗಾಗಿ ಈ ದ್ವೀಪ ಪ್ರವಾಸಿಗರಿಗೆ ಅಪಾರ ಆಕರ್ಷಕ ತಾಣವಾಗಿದೆ. ಇಲ್ಲಿನ ಜನ ಸಹ ಸೌಜನ್ಯಶೀಲರು. ಸೃಷ್ಟಿಯ ಶೃಂಗಾರವನ್ನೆಲ್ಲ ಒಳಗೊಂಡ ಈ ದ್ವೀಪದ ಮುಖ್ಯ ಕಸುಬು ಕೃಷಿ, ತೋಟಗಾರಿಕೆ ಮತ್ತು ಪ್ರವಾಸೋದ್ಯವಾಗಿರುವುದರಿಂದ, ಇದೊಂದು ಶ್ರೀಮಂತ ದ್ವೀಪವಾಗಿದೆ.

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ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ ರಚನಾ ಹಾಗು ಪಠ್ಯಪುಸ್ತಕ ಸಮಿತಿ

- **ಸಂಪಾದಕೀಯ ಸಮಿತಿ:**

1. ಶ್ರೀ ಟಿ ಎಲ್ ರವೀಂದ್ರ, ಉಪನ್ಯಾಸಕರು, ಸರ್ಕಾರಿ ಜಿ.ಆರ್.ಐ.ಸಿ.ಪಿ ಬೆಂಗಳೂರು.
2. ಶ್ರೀ ಟಿ. ತಿಮ್ಮಪ್ಪ, ಉಪನ್ಯಾಸಕರು(ಆಯ್ಕೆ ಶ್ರೇಣಿ), ಯಾಂತ್ರಿಕ ವಿಭಾಗ, ಸರ್ಕಾರಿ ಪಾಲಿಟೆಕ್ನಿಕ್, ತುಮಕೂರು.

- **ಸಲಹಾ ಸಮಿತಿಯ ಬಾಹ್ಯ ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳು.**

1. ಪ್ರೊ. (ಡಾ.) ಡಿ. ಪಾಂಡುರಂಗ ಬಾಬು, ಕುಲಸಚಿವರು, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
2. ಪ್ರೊ. (ಡಾ.) ಅಶೋಕ್ ಕುಮಾರ್ ರಂಜರೆ, ಪ್ರಾಧ್ಯಾಪಕರು, ಪ್ರಸಾರಾಂಗ ವಿಭಾಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
3. ಪ್ರೊ. (ಡಾ.) ಕೆ ವೈ ನಾರಾಯಣ ಸ್ವಾಮಿ, ಸಹ ಪ್ರಾಧ್ಯಾಪಕರು, ಸ್ನಾತಕೋತ್ತರ ವಿಭಾಗ, ಸರ್ಕಾರಿ ಕಲಾ ಕಾಲೇಜು, ಬೆಂಗಳೂರು.
4. ಪ್ರೊ. (ಡಾ.) ಜೆ ಬಾಲಕೃಷ್ಣ, ಪ್ರಾಧ್ಯಾಪಕರು ಹಾಗು ಮುಖ್ಯಸ್ಥರು, ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ವಿಭಾಗ, ಕೃಷಿ ವಿಶ್ವವಿದ್ಯಾಲಯ, (ಜಿಕೆವಿಕೆ) ಹೆಬ್ಬಾಳ, ಬೆಂಗಳೂರು.