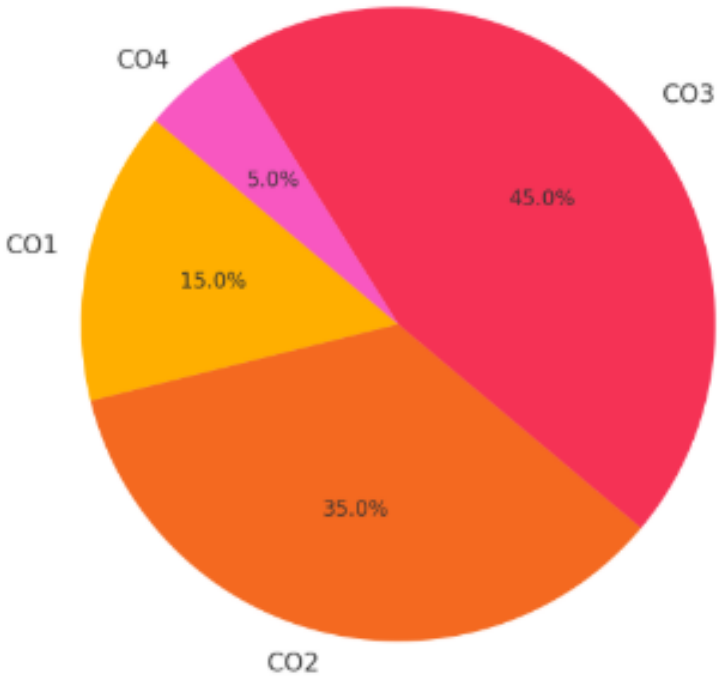
DIGITAL ELECTRONICS – I (25EC11I)

END EXAM WEIGHTAGE OF MARKS AS PER COs and WEEKS.

COs	Week	Weightage of marks	Sections	
CO1	**1,2**	**15%**	**Section-I**	**30 Marks**
CO4	**3**	**5%**	**Section-I**	**10 Marks**
CO2	**4,5**	**20%**	**Section-II**	**40 Marks**
	6,7	**15%**	**Section-III**	**30 Marks**
CO3	**8-13**	**45%**	**Section-III** **Section-IV** **Section-V**	**10 Marks** **40 Marks** **40 Marks**
			Total Marks →	**200 Marks**



Government of Karnataka
Department of Technical Education
Board of Technical Examinations

Model Question Paper - 1

Programme	: Electronics & Communication	**Semester**	: I
Course	: Digital Electronics - I	**Course Code**	: 25EC11I
Time	: 3 Hours	**Max. Marks**	: 100

Instructions:

For Part-A questions, only the first written answers will be considered for evaluation.

PART A

I. Select the correct answer from the choices given: 15X1 = 15

1. Binary number system uses base:
   A) 10 B) 8 C) 2 D) 16
2. The decimal equivalent of binary 1011 is:
   A) 13 B) 11 C) 10 D) 9
3. Gray code is primarily used to:
   A) Reduce power B) Simplify arithmetic C) Minimize error D) Reduce cost
4. A logic gate with output 1 when all inputs are 0 is:
   A) OR B) AND C) NOR D) NAND
5. Which gate is called a universal gate?
   A) AND B) OR C) NAND D) NOT
6. SOP stands for:
   A) Simple Operational Program B) Sum of Products C) Standard Output Process D) Sequential Order Processing
7. K-map is used for:
   A) Multiplication B) Boolean simplification C) Code conversion D) Number addition
8. The output of an EX-OR gate is high when:
   A) All inputs are same B) Inputs are different C) All inputs are high D) All inputs are low
9. Which of these is not a combinational circuit?
   A) Half Adder B) Encoder C) Flip-Flop D) Multiplexer
10. The IC 7486 represents:
    A) AND gate B) OR gate C) EX-OR gate D) NAND gate
11. The basic building blocks of digital circuits are:
    A) Transistors B) Capacitors C) Logic gates D) Resistors
12. A 4:1 MUX has:
    A) 2 input lines B) 4 output lines C) 4 select lines D) 4 input lines

13. ASCII code is used for:
    A) Images B) Audio signals C) Character representation D) Voltage levels

14. A full subtractor has how many inputs?
    A) 2 B) 3 C) 4 D) 1

15. In BCD code, decimal 9 is represented as:
    A) 1001 B) 1010 C) 1111 D) 1000

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5X1 = 05
(NAND, K-map, Binary, De-Morgan, Decoder)

1. _____ is used to simplify Boolean expressions graphically.
2. _____ logic gates are known as a universal gate.
3. _____ number system uses only 0s and 1s.
4. _____ theorem relates AND/OR with NOR/NAND.
5. _____ is used to convert binary code into a decimal output.

PART B

III. Answer any FIVE questions: 5X2 = 10

1. Define binary number system.
2. Write the truth table for an AND gate.
3. What is 2's complement? Give one example.
4. Define SOP and POS forms.
5. Mention any two applications of multiplexers.
6. Write two features of Gray code.
7. State any two Boolean laws.
8. Define Half Adder.

PART C

IV. Answer any FIVE questions: 5X3 = 15

1. Convert $(255)_{10}$ to binary.
2. Explain with diagram the operation of NOT and NOR gates.
3. Derive 1's complement and 2's complement of 101010.
4. Write standard SOP expression for $F(A,B,C) = \Sigma(1,3,4,6)$.
5. Explain the need and application of logic families.
6. Draw the block diagram and truth table of 2:4 Decoder.
7. Compare analog and digital signals.
8. Simplify F = A'BC + ABC+B’C using Boolean laws.

PART D (Section I)

V. Answer any FIVE questions: 5X5 = 25

1. With examples, explain number system conversions between binary and hexadecimal.
2. Explain the working of EX-OR and EX-NOR gates with truth tables.
3. Explain De-Morgan's Theorems with proof and truth tables.
4. Convert given expression F = A'BC + AB'C + ABC' to standard SOP and implement using logic gates.
5. Explain simplification of Boolean expression using 3-variable K-map.
6. Draw and explain the block diagram of 4:1 MUX with truth table.
7. Realize all basic gates using only NAND gates.
8. With diagram, explain the working of a 1-bit magnitude comparator.

PART D (Section II)

VI. Answer any THREE questions: 3X10 = 30

1. Design a full adder using two half adders. Explain with truth table and logic diagram.
2. Simplify the Boolean Expression F = A'B + AB' + ABC using K-map. Implement using logic gates.
3. Design and explain 3-bit parallel adder using block diagram.
4. Draw and explain the logic diagram of a 4:2 Encoder and a 2:4 Decoder.
5. Implement BCD to 7-segment decoder and explain its working with truth table (common anode).

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Department of Technical Education
Board of Technical Examinations

Model Question Paper - 2

Programme	: Electronics & Communication	**Semester**	: I
Course	: Digital Electronics - I	**Course Code**	: 25EC11I
Time	: 3 Hours	**Max. Marks**	: 100

Instructions:

For Part-A questions, only the first written answers will be considered for evaluation.

PART A

I. Select the correct answer from the choices given: 15X1 = 15

1. The hexadecimal number system uses base:
   A) 2 B) 8 C) 10 D) 16
2. The binary equivalent of decimal 13 is:
   A) 1010 B) 1100 C) 1101 D) 1110

3. ASCII code is mainly used to represent:
   A) Colors B) Characters C) Voltages D) Numbers

4. Which logic gate gives output 0 when all inputs are 1?
   A) AND B) OR C) NAND D) NOR

5. A NOR gate is equivalent to:
   A) AND + NOT B) OR + NOT C) NAND + NOT D) EX-OR + NOT

6. Boolean expression X + XY simplifies to:
   A) X+Y B) XY C) X D) X + Y

7. Which of the following expressions is in POS form?
   A) AB + C B) A + B + C C) (A+B)(C+D) D) A.B + C

8. A K-map for 3 variables will have how many cells?
   A) 4 B) 6 C) 8 D) 16

9. The XOR gate is also known as:
   A) Odd detector B) Even detector C) Converter D) Inverter

10. A half adder adds:
    A) Two bits B) Three bits C) Four bits D) Five bits

11. The number of select lines for an 8:1 MUX is:
    A) 2 B) 3 C) 4 D) 5

12. BCD stands for:
    A) Binary Coded Decimal B) Binary Calculated Data C) Base Code Digit D) Bit-Coded Data

13. Decimal 7 is represented in BCD as:
    A) 0111 B) 1110 C) 1111 D) 1000

14. A 2:4 decoder has how many input lines?
    A) 2 B) 3 C) 4 D) 5

15. The primary application of De-MUX is:
    A) Data compression B) Data selection C) Data distribution D) Data modulation

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5X1 = 05
(Binary, Decoder, NOR, EX-OR, BCD)

1. _____ code is used to represent each decimal digit in binary form.
2. _____ gate gives high output only when inputs differ.
3. _____ is used to decode binary input into specific outputs.
4. _____ number system uses base 2.
5. _____ gate is a universal gate along with NAND.

PART B

III. Answer any FIVE questions: 5X2 = 10

1. Define Binary and hexadecimal number system.
2. Write the truth table for a NAND gate.
3. Find 2's complement of $(10110111)_2$.
4. What is a universal gate and mention universal gates?

5. Mention two applications of K-map.
6. Draw the Logic diagram of 2:1 MUX.
7. Write truth table of Half Subtractor.
8. What is the use of a multiplexer?

PART C

IV. Answer any FIVE questions: 5X3 = 15

1. Convert $(455)_{10}$ to hexadecimal.
2. Draw the symbol and truth table of EX-NOR gate.
3. State and prove the commutative law of Boolean algebra.
4. Simplify the expression F = A'B + AB' using K-map.
5. Write a short note on serial and parallel adders.
6. Draw the logic circuit of 1:2 De-MUX and its truth table.
7. List any three characteristics of logic families.
8. Write the logical expression and truth table for a Full Subtractor.

PART D (Section I)

V. Answer any FIVE questions: 5X5 = 25

1. Explain Binary, Decimal and Hexadecimal number systems with one example each.
2. Draw and explain logic diagram of 4:1 MUX with truth table.
3. Prove De-Morgan's theorems using truth tables.
4. Realize the Boolean function F = A'B + AB using logic gates.
5. Convert the following expression into POS form and implement: F = A + B'C.
6. Explain the design and working of 1-bit magnitude comparator.
7. Implement all basic gates using NOR gates.
8. Explain the features, truth table and logic circuit of a 4:2 Encoder.

PART D (Section II)

VI. Answer any THREE questions: 3X10 = 30

1. Explain the working of Full Subtractor using logic diagram and truth table.
2. Design 3-variable SOP Boolean expression $F(A,B,C)=\sum m(1,3,5,6)$ using K-map and implement.
3. Draw and explain 8-bit serial adder and compare with parallel adder.
4. Construct and explain BCD to Decimal decoder using logic gates.
5. Describe 7-segment display working and its interfacing with decoder IC.

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Model Question Paper - 3

Programme	: Electronics & Communication	**Semester**	: I
Course	: Digital Electronics - I	**Course Code**	: 25EC11I
Time	: 3 Hours	**Max. Marks**	: 100

Instructions:

For Part-A questions, only the first written answers will be considered for evaluation.

PART A

I. Select the correct answer from the choices given: 15X1 = 15

1. Decimal number system is based on:
   A) Base 2 B) Base 8 C) Base 10 D) Base 16
2. Which of the following is a non-weighted code?
   A) BCD B) Excess-3 C) Gray D) Decimal
3. A NOT gate has:
   A) One input, one output B) Two inputs, one output C) One input, two outputs D) Two inputs, two outputs
4. The output of NAND gate is low only when:
   A) Any one input is high B) All inputs are high C) All inputs are low D) Any one input is low
5. Which logic gate can be used to build any digital circuit?
   A) AND B) OR C) NAND D) EX-OR
6. Which of the following is a valid Boolean identity?
   A) A + A = 1 B) A . A = A C) A + 1 = 0 D) A . 0 = A
7. POS stands for:
   A) Product of Sum B) Position of System C) Pulse over Speed D) Power of Signal
8. The number of cells in a 2-variable K-map is:
   A) 2 B) 4 C) 8 D) 16
9. The basic function of a MUX is to:
   A) Add data B) Store data C) Select data D) Compare data
10. IC 7408 contains:
    A) NOT gates B) AND gates C) OR gates D) NAND gates
11. Binary equivalent of decimal 5 is:
    A) 1100 B) 1010 C) 0101 D) 1111
12. Decimal equivalent of $(1101)_2$ is:
    A) 13 B) 12 C) 14 D) 11
13. A half adder can add:
    A) Two 4-bit numbers B) Two 1-bit numbers C) Three 1-bit numbers D) Four 1-bit numbers

14. In a full subtractor, the borrow output is high when:
    A) Minuend > Subtrahend B) Subtrahend > Minuend C) Inputs are same D) Inputs are 0

15. A decoder converts:
    A) Binary to BCD B) BCD to Decimal C) Binary input to unique output D) Input to address

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5X1 = 05
(AND, SOP, Hexadecimal, Comparator, Seven-Segment)

1. _____ gate gives output 1 only when all inputs are 1.
2. _____ number system uses base 16.
3. _____ form is the sum of product terms.
4. A _____ circuit compares two binary numbers.
5. _____ display is used to display decimal digits electronically.

PART B

III. Answer any FIVE questions: 5X2 = 10

1. Define digital signal with an example.
2. Write the truth table for OR gate.
3. What is the 2's complement of binary number 1101?
4. Write any two Boolean laws.
5. What is the function of a Decoder?
6. Write truth table of NAND gate.
7. Define full adder.
8. Mention two applications of 7-segment display.

PART C

IV. Answer any FIVE questions: 5X3 = 15

1. Convert $(77)_{10}$ to binary and BCD.
2. Write a short note on De-Morgan's theorems.
3. Construct truth table and expression for NOR gate.
4. Simplify the Boolean Expression F=AB+AB′+A′B using Boolean laws.
5. List the applications of Encoder.
6. Write the truth table and logic expression for 1-bit comparator.
7. Explain the working of 2:1 Multiplexer.
8. Write a note on binary to Gray code conversion.

PART D (Section I)

V. Answer any FIVE questions: 5X5 = 25

1. Explain binary and hexadecimal number systems with one example each.

2. Explain EX-OR and EX-NOR gates with symbols, truth tables and expressions.
3. Realize Boolean Expression F = AB + A'B using logic gates.
4. Simplify F = A'B + AB + AB' using K-map (3-variable).
5. Draw the logic circuit of 1:4 De-MUX and explain its working.
6. Compare SOP and POS forms with examples.
7. Explain the working of 4:2 Encoder with block diagram and truth table.
8. Implement all basic logic gates using NAND gate.

PART D (Section II)

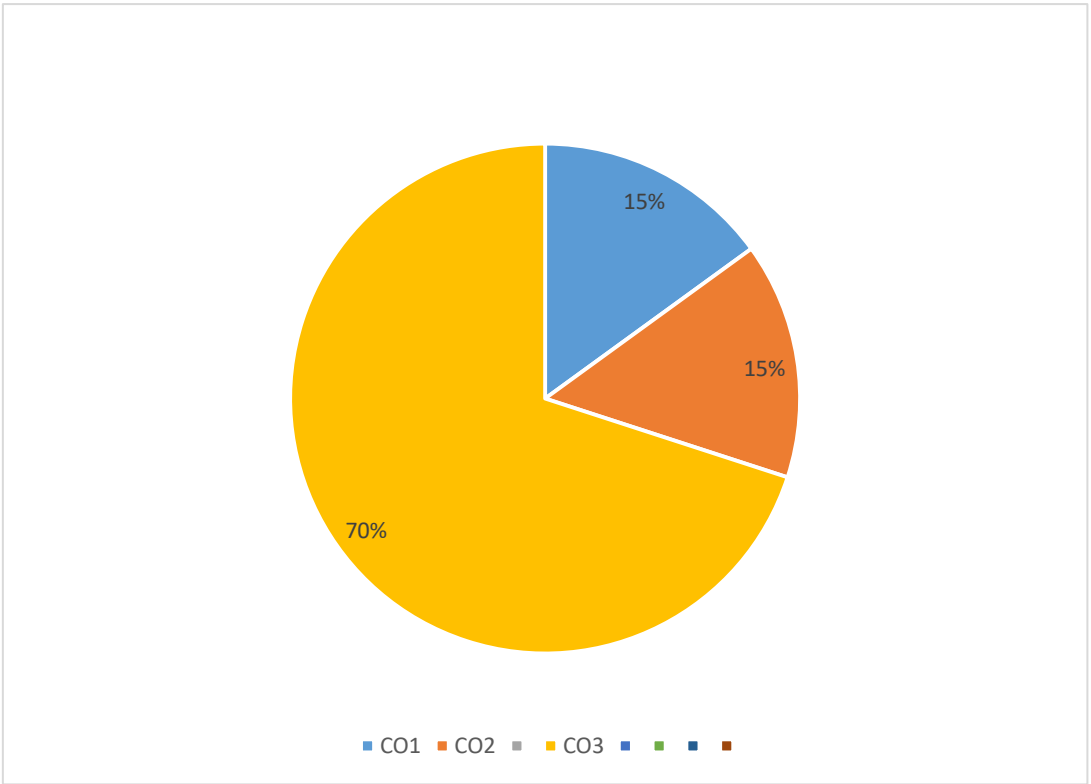
VI. Answer any THREE questions: 3X10 = 30

1. Design a full adder using logic gates and explain the logic with truth table.
2. Simplify F(A, B,C) = Σ(1,2,5,6) using 3-variable K-map. Construct logic circuit for the simplified expression.
3. Explain 8-bit serial adder with suitable diagram.
4. Design a combinational logic circuit for BCD to 7-segment decoder (common anode).
5. Explain the construction, truth table and working of Decimal to BCD encoder.

APPLIED ELECTRONICS – I (25EC21I)

END EXAM WEIGHTAGE OF MARKS AS PER COs and WEEKS.

COs	Week	Weightage of marks	Sections	
CO1	1,2	15%	Section-I	30 Marks
CO2	3,4	5%	Section-I	10 Marks
		10%	Section-II	20 Marks
CO3	5 -13	10%	Section-II	20 Marks
		20%	Section-III	40 Marks
		20%	Section-IV	40 Marks
		20%	Section-V	40 Marks
			Total Marks →	200 Marks



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Model Question Paper - 1

Programme	: Electronics & Communication	**Semester**	: II
Course	: Applied Electronics - I	**Course Code**	: 25EC21I
Time	: 3 Hours	**Max. Marks**	: 100

Instructions:

For Part-A questions, only the first written answers will be considered for evaluation.

PART A

I. Select the correct answer from the choices given: 15X1 = 15

1. Which particles are involved in electrical conduction?
   A) Protons B) Neutrons C) Electrons D) Positrons
2. What is the valence electron count of silicon?
   A) 2 B) 3 C) 4 D) 5
3. What does a bridge rectifier convert?
   A) AC to AC B) DC to AC C) AC to DC D) DC to DC
4. Zener diode operates in which region?
   A) Forward bias B) Reverse breakdown C) Cut-off D) Saturation
5. A BJT is controlled by:
   A) Voltage B) Magnetic field C) Current D) Light
6. Which configuration provides high voltage gain?
   A) CE B) CB C) CC D) EE
7. Which parameter represents current gain in BJT?
   A) Alpha B) Beta C) Gamma D) Eta
8. Which coupling is commonly used in audio amplifiers?
   A) Transformer B) RC C) Direct D) Inductive
9. FET is a:
   A) Current-controlled device B) Voltage-controlled device
   C) Light-controlled device D) Time-controlled device

10. JFET has:

    A) Low input resistance B) High input resistance

    C) No input resistance D) Variable input resistance

11. CMOS logic consumes:

    A) High power B) Low power C) No power D) Infinite power

12. Amplification factor of JFET is:

    A) rd/gfs B) gfs/rd C) rd x gfs D) gfs + rd

13. Which device is used as voltage regulator?

    A) Diode B) LED C) Zener Diode D) Photodiode

14. The main function of heat sink in transistor circuits is to:

    A) Reduce gain B) Provide resistance C) Dissipate heat D) Regulate voltage

15. What is the purpose of biasing a transistor?

    A) Turn it off B) Destroy it C) Set operating point D) Amplify noise

PART A

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5X1 = 05

(**Bridge, Voltage, Electrons, Breakdown, Silicon**)

1. _____ is used in semiconductors for its 4 valence electrons.
2. The flow of current in a conductor is due to _____.
3. Zener diode operates in the _____ region.
4. _____ rectifier uses 4 diodes in its circuit.
5. FET is a _____ controlled device.

PART B

III. Answer any FIVE questions: 5X2 = 10

1. Define electronics.
2. State any two features of JFET.
3. Mention the use of a heat sink in BJT.
4. Define beta of a transistor.
5. Give two advantages of RC coupled amplifiers.
6. State the need for transistor biasing.
7. Mention any two differences between JFET and BJT.
8. Write two applications of Zener diode.

PART C

IV. Answer any FIVE questions: 5X3 = 15

1. Explain Bohr's atomic model.
2. Compare CE and CC configurations.
3. List any three applications of amplifiers.
4. What is the need of DC load line?
5. Explain the working of a photo diode.
6. Derive the relationship between alpha and beta.
7. Write the frequency response of CE amplifier.
8. Define transconductance and amplification factor in JFET.

PART D (Section I)

V. Answer any FIVE questions: 5X5 = 25

1. Explain the construction and working of a Zener diode as a voltage regulator.
2. Describe the construction and working of LED with a neat diagram.
3. Explain the concept and working of single-stage CE amplifier.
4. Compare CB, CE, and CC configurations based on input/output resistance and gain.
5. Explain multistage amplifier.
6. Describe the Principle and working of JFET (N channel).
7. List the applications and advantages of CMOS.
8. Explain the drain characteristics of D-MOSFET.

PART D (Section II)

VI. Answer any THREE questions: 3X10 = 30

1. With neat diagram, explain the operation of bridge rectifier with capacitive filter
2. Explain the working of enhancement type MOSFET. Compare with D-MOSFET.
3. With diagram, explain the construction, operation and characteristics of CE amplifier.
4. Draw and explain RC coupled amplifier.
5. Explain working of CMOS inverter and list its applications.

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Model Question Paper - 2

Programme	: Electronics & Communication	**Semester**	: II
Course	: Applied Electronics - I	**Course Code**	: 25EC21I
Time	: 3 Hours	**Max. Marks**	: 100

Instructions: For Part-A questions, only the first written answers will be considered for evaluation.

PART A

I. Select the correct answer from the choices given: 15X1 = 15

1. Which of the following elements is tetravalent?
   A) Phosphorus B) Boron C) Silicon D) Aluminum
2. In a conductor, the current flow is mainly due to:
   A) Neutrons B) Holes C) Electrons D) Ions
3. Ripple factor in a rectifier indicates:
   A) Voltage regulation B) Efficiency C) Purity of DC D) Frequency
4. Zener diode is commonly used for:
   A) Amplification B) Rectification C) Voltage regulation D) Switching
5. BJT is a:
   A) Voltage device B) Power device C) Current-controlled device D) Heat device
6. The configuration with highest input resistance is:
   A) CE B) CC C) CB D) EC
7. The transistor parameter 'alpha' is defined for:
   A) CE B) CC C) CB D) CMOS
8. The coupling used for wide bandwidth is:
   A) RC B) Transformer C) Direct D) Capacitive
9. FET has:
   A) Low input impedance B) High power output C) High input impedance D) No gain

10. The gate of a JFET is always:
    A) Forward biased B) Reverse biased C) Shorted D) Floating
11. CMOS technology is popular because of:
    A) Cost B) Power efficiency C) Noise D) Heat
12. Transconductance in JFET is given by:
    A) Id/Vgs B) Vgs/Id C) Vds/Ig D) Ig/Id
13. Which of the following devices can amplify current?
    A) Diode B) Zener Diode C) BJT D) FET only
14. The efficiency of a full wave rectifier is:
    A) 25% B) 40.6% C) 81.2% D) 100%
15. The biasing used for thermal stability in BJT is:
    A) Fixed bias B) Collector feedback C) Voltage divider bias D) Emitter bias

PART A

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5X1 = 05

(**Ripple, CE, Silicon, Reverse, Transistor**)

1. _____ is widely used in electronic circuits as a basic switching device.
2. _____ is a semiconductor material used in most devices.
3. Zener diode works in the _____ bias condition.
4. Amplifiers with high voltage gain use _____ configuration.
5. The unwanted AC in the rectifier output is called _____.

PART B

III. Answer any FIVE questions: 5X2 = 10

1. Define valence electron.
2. Mention any two applications of photo diode.
3. List the regions of transistor operation.
4. Write two advantages of using FET.
5. What is the role of bypass capacitor in CE amplifier?
6. Define ripple factor.
7. What are the two main types of MOSFETs?
8. List any two differences between D-MOSFETs and JFETs.

PART C

IV. Answer any FIVE questions: 5X3 = 15

1. Draw the atomic structure of Silicon and label.
2. List any three applications of LED.
3. State the need for amplifier coupling.
4. With expression define alpha in BJT.
5. Explain the function of emitter bypass capacitor.
6. List any three applications of FET.
7. Define voltage gain and current gain of an amplifier.
8. Explain the construction of enhancement MOSFET.

PART D (Section I)

V. Answer any FIVE questions: 5X5 = 25

1. Describe the classification of solids based on energy bands.
2. Explain the operation of bridge rectifier with waveform.
3. Explain input characteristics of CE configuration.
4. With diagram, explain RC coupled amplifier.
5. Describe the construction and working of LED.
6. Draw and explain transfer characteristics of N-Channel JFET.
7. Compare D-MOSFET and E-MOSFET.
8. Describe CMOS inverter operation and its significance.

PART D (Section II)

VI. Answer any THREE questions: 3X10 = 30

1. Explain output characteristics of CE configuration with circuit diagram.
2. Explain the Direct coupled amplifier with circuit diagram and its frequency response.
3. State the relationship between alpha, beta and gamma. Given $\beta = 100$ and $I_b = 50\mu A$, calculate I_c and I_e in CE configuration.
4. Explain the construction and working of enhancement MOSFET.
5. A bridge rectifier has a DC output current of 0.8 A and an RMS current of 1A, delivers 12 V DC across a 10 Ω load. The total AC input power is 20 W. Find ripple factor and efficiency.

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Model Question Paper - 3

Programme	: Electronics & Communication	**Semester**	: II
Course	: Applied Electronics - I	**Course Code**	: 25EC21I
Time	: 3 Hours	**Max. Marks**	: 100

Instructions: For Part-A questions, only the first written answers will be considered for evaluation.

PART A

I. Select the correct answer from the choices given: 15X1 = 15

1. The current flow in semiconductors is due to:
   A) Electrons only B) Holes only C) Electrons and holes D) Ions
2. Which one of the following has four valence electrons?
   A) Phosphorus B) Boron C) Silicon D) Arsenic
3. The function of a capacitor in a rectifier circuit is to:
   A) Rectify current B) Store energy C) Filter AC component D) Control frequency
4. In reverse bias, a Zener diode acts as:
   A) Open switch B) Short circuit C) Voltage stabilizer D) Amplifier
5. Which of the following is a unipolar device?
   A) BJT B) FET C) SCR D) UJT
6. The current gain of CE configuration is represented by:
   A) Alpha B) Gamma C) Beta D) Omega

7. Voltage divider bias provides:
   A) No stability B) Poor stability C) Good thermal stability D) Negative feedback
8. Direct coupling is suitable for:
   A) Audio amplifiers B) Video amplifiers C) DC amplifiers D) RF amplifiers
9. In a JFET, the drain current is controlled by:
   A) Gate current B) Gate voltage C) Drain voltage D) Source resistance
10. Which of the following offers highest input impedance?
    A) BJT B) MOSFET C) JFET D) CMOS
11. CMOS stands for:
    A) Complex Metal Oxide Semiconductor B) Complementary MOS
    C) Controlled MOS D) Constant MOS
12. In D-MOSFET, the channel is:
    A) Created by applying voltage B) Present initially
    C) Not present D) Removed during operation
13. Which amplifier configuration has no phase shift?
    A) CE B) CB C) CC D) None of the above
14. A device that converts electrical energy to light is:
    A) Zener diode B) LED C) BJT D) SCR
15. The amplifier that alloows both AC and DC components is:
    A) RC coupled B) Direct coupled C) Transformer coupled D) Bandpass

PART A

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5X1 = 05 (**Zener, Holes, Gain, LED, RC**)

1. _____ diode is used for voltage regulation.
2. In a P-type semiconductor, the majority carriers are _____.
3. _____ is the ratio of output signal to input signal in an amplifier.
4. _____ is a device that emits light when forward biased.
5. _____ coupling is widely used in amplifier stages for audio frequency applications.

PART B

III. Answer any FIVE questions: 5X2 = 10

1. Define energy band.
2. Mention any two applications of FET.
3. Write the need for amplifier coupling.
4. State the use of emitter resistor in CE amplifier.
5. What is meant by drain resistance?
6. Give two advantages of CMOS circuits.
7. Define alpha and beta.
8. Define rectifier.

PART C

IV. Answer any FIVE questions: 5X3 = 15

1. Explain the concept of free and valence electrons.
2. Describe the working of a photo diode.
3. Compare the characteristics of CE and CB configuration.
4. Draw and label the symbol of a N-Channel JFET.
5. Define thermal runaway and suggest methods to prevent it.
6. Write a short note on frequency response of amplifier.
7. Explain the function of coupling capacitor.
8. List the applications of CMOS inverter.

PART D (Section I)

V. Answer any FIVE questions: 5X5 = 25

1. Draw and explain the energy band diagrams for semiconductor.
2. Explain the reverse bias characteristics of ZENER Diode.
3. Explain output characteristics of CE configuration.
4. Describe working principal of N-channel JFET.

5. Explain the working of LED with a neat diagram.
6. Illustrate enhancement mode MOSFET transfer characteristics.
7. Compare D-MOSFET and E-MOSFET.
8. List the features of CMOS.

PART D (Section II)

VI. Answer any THREE questions: 3X10 = 30

1. Explain the working of Bridge rectifier with neat diagram and waveforms.
2. Sketch and explain the input and output characteristics of CE amplifier.
3. With expressions, Define JFET parameters: resistance (rd), Transconductance (gfs),Amplification Factor(μ) and also write the relation between them.
4. Describe the construction and operation of single stage RC coupled amplifier.
5. Describe the construction and biasing of PNP transistor.