

7695**Code : 20CE53I**Register
Number

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V Semester Diploma Examination, February/March-2023**TRANSPORTATION ENGINEERING****Time : 3 Hours]****[Max. Marks : 100****Instruction :** Answer any **one** full question from section.**SECTION – I**

1. (a) Propose the best suited ideal requirements you can come across while aligning a National Highway proposed between Bangalore to Mumbai. **10**
- (b) Vehicle met with an accident midway while travelling from city A to city B. How would you investigate and find the root cause for the accident with various perspective. **10**
2. (a) The speed of overtaking and overtaken vehicles are 70 and 40 kmph, respectively on a two way traffic road. If acceleration of overtaking vehicle is 0.99 m/sec^2 . **10**
- (i) Calculate safe overtaking sight distance
- (ii) Mention the minimum length of overtaking zone and
- (iii) Draw a neat sketch of the overtaking zone and show the position of sign posts.
- (b) Spot speed studies were carried out at a certain stretch of a highway and the consolidated data collected are given below : **10**

Speed range, kmph	No. of vehicles observed	Speed range, kmph	No. of vehicles observed
0 to 10	12	50 to 60	255
10 to 20	18	60 to 70	119
20 to 30	68	70 to 80	43
30 to 40	89	80 to 90	33
40 to 50	204	90 to 100	9

- (i) Determine upper lower values or speed limits for regulations of mixed traffic flow.
- (ii) The design speed for checking the geometric design elements of the highway.

SECTION – II

3. (a) Figure out the derivation between the Bituminous pavements and concrete pavements. **10**
- (b) You being an Engineer at highway construction site enumerate the prevailing steps of bituminous macadam road construction. **10**
4. (a) The results of sieve analysis of a soil are given below : **10**

Sieve size, mm	Percent passing
4.76	60
2.00	30
0.60	10
0.40	.5
0.20	0

- (i) Classify the soil by (1) unified (2) HRB soil classification system.
- (ii) Discuss the suitability of the soil as a subgrade materials.
- (b) Design a new flexible pavement for a two-lane undivided carriage way using the following data : **10**
- (i) Design CBR values of subgrade – 5%.
- (ii) Initial traffic on completion – 300 CV/day of construction
- (iii) Average growth rate – 6% per year.
- (iv) Design life – 10 years
- (v) VDF value – 2.5

SECTION – III

5. (a) Enumerate your views on highway drainage significances & its requirements. **10**
- (b) A Village Panchyat has called for a tender to connect a remote locality and requested for the procedure of construction of low volume earth roads, you being the contractor listout the procedure. **10**

6. Prepare a detailed estimate for earthwork for a portion of a road from the following : 20

Dist. in M	0	100	200	300	400	500	600	700	800	900	1000	1100	1200
R.L. of ground	114.50	114.75	115.25	115.50	116.10	116.85	118.00	118.25	118.10	117.80	117.75	117.90	119.50
R.L. of formation													
	1 in 200 upto 600 m upward gradient							1 in 400 downward gradient					

formation width is 10 m, side slope 2 : 1 in banking, 1.5 : 1 in cutting

SECTION – IV

7. (a) You are working in Bridge construction project. 10
- (i) Articulate factors you consider for selection of site for bridge construction.
- (ii) Draw a typical cross-section of bridge and show its components.
- (b) Illustrate various components and requirements of a good track to be considered while aligning Railway track. 10
8. (a) While working in Airport construction project. 10
- (i) Write the factors you consider for selection of site for airport construction.
- (ii) What are the importance of Airport lightning in the project ?
- (b) As a site engineer while surveying and fixing alignment of railway track, you will encounter some place where tunnel needs to be constructed based on the condition : 10
- (i) Justify your decision of constructing tunnel with the advantages of tunneling.
- (ii) Justify why tunnel lining & ventilation should be given.

SECTION – V

9. (a) You being Road Safety auditor. Illustrate stages and objective of road safety auditing. **10**
- (b) Enumerate the importance of multimodal transportation system. BRT & LRT individually. **10**
10. (a) Explain the procedure of Environmental impact assessment process for highway project. **10**
- (b) Illustrate Health Impact Assessment process of Highway Project. **10**
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