

CBCS SCHEME



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15CV63

Sixth Semester B.E. Degree Examination, Feb./Mar. 2022 Highway Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the characteristics of road transport in comparison with other systems? (08 Marks)
b. Explain briefly the contribution of the following in road development in India,
i) Indian Road Congress (IRC)
ii) Central Road Fund (CRF). (08 Marks)

OR

- 2 a. Explain the scope of Transportation Engineering. (06 Marks)
b. List out the salient features of PMGSY and NHDP in India. (10 Marks)

Module-2

- 3 a. Explain the different engineering surveys, for highway location. (08 Marks)
b. Calculate the stopping sight distance on a highway at a descending gradient of 2% for a design speed of 80kmph. Assume other data as per IRC recommendations. (08 Marks)

OR

- 4 a. Explain the different highway planning surveys. (08 Marks)
b. Calculate the extra widening required for a pavement of width 7.0m on a horizontal curve of radius 200m if the longest wheel base of vehicle expected on the road is 65m. Design speed is 65kmph. (08 Marks)

Module-3

- 5 a. What are the desirable properties of sub-grade? Mention the various tests conducted on sub-grade soil for its evaluation. (06 Marks)
b. Explain 'ESWL' and the concept in the determination of the equivalent single wheel load by graphical method. (06 Marks)
c. Differentiate between flexible pavements and rigid pavements. (04 Marks)

OR

- 6 a. Enumerate the steps for the determination of modulus of subgrade reaction and for making corrections for subsequent soaking. (08 Marks)
b. Calculate the ESWL for the following data $P = 4100\text{kg}$ on each wheel centre to centre spacing of tyres 30cm, distance between walls 12cm, calculate ESWL at, 20cm, 25cm, and 30cm depth of pavement. (08 Marks)

Module-4

- 7 a. What are the main design elements of highway embankments? (08 Marks)
b. Mention the materials used and explain the construction procedure of WBM (Water Bound Macadam). (08 Marks)



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OR

- 8 a. List the desirable properties of bituminous mix, for pavement surface course. (08 Marks)
b. What are the objects construction of Grannular sub-base course, also mention the quality control checks. (08 Marks)

Module-5

- 9 a. What are the requirements and importance of highway drainage? (08 Marks)
b. Explain briefly various highway user benefits. (08 Marks)

OR

- 10 a. The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is $0.9\text{m}^3/\text{sec}$. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0m and cross slope to be 1.0 vertical to 1.5 horizontal, the allowable velocity of flow in the drain is 1.2m/sec, and Manning's roughness coefficient is 0.02. (10 Marks)
b. Explain the concept of BOT and BOOT method of highway financing. (06 Marks)

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