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CBCS SCHEME

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21CV52

Fifth Semester B.E./B.Tech. Degree Examination, June/July 2026
Transportation Engineering

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Explain briefly about importance of transportation for the needs of society. **(06 Marks)**

b. Explain briefly about National Highway Development Project (NHDP) comprising of different phases. **(07 Marks)**

c. Explain briefly about objectives and phases of highway planning. **(07 Marks)**

OR

2 a. Explain briefly about different modes of transportation along with comparison of their characteristics. **(07 Marks)**

b. Explain briefly about characteristics of ideal highway alignment connecting between two places. **(06 Marks)**

c. Explain briefly about engineering surveys conducted for highway alignment. **(07 Marks)**

Module-2

3 a. Explain briefly about various features of highway cross-sectional elements. **(07 Marks)**

b. Explain briefly about various factors controlling stopping sight distance. **(06 Marks)**

c. A vertical summit curve is formed at intersection of two gradients +3% and –5%. Design the length of summit curve to provide a stopping sight distance for a design speed of 80 kilo meter per hour. Consider the condition of length of valley curve greater than stopping sight distance, coefficient of friction as 0.35 and reaction time as 2.50 seconds. **(07 Marks)**

OR

4 a. Explain briefly about different components of flexible pavement with the aid of a neat sketch along with their functions in the pavement. **(07 Marks)**

b. Determine the absolute minimum sight distance required to avoid a head on collision of two cars A and B approaching form the opposite directions on leveled road at 90 and 75 kilo meter per hour respectively. Assume reaction time as 2.50 seconds, coefficient of friction as 0.85 and brake efficiency of 50% for both cars. **(06 Marks)**

c. Explain briefly about different types of highway pavements along with their merits and demerits. **(07 Marks)**

Module-3

5 a. Explain briefly about the desirable properties of sub-grade soil. **(07 Marks)**

b. A plate load test is conducted on a soaked sub-grade soil during monsoon season using plate diameter of 300 mm. The load values corresponding to mean settlement of dial gauge readings are as shown in the Table Q5(b). Determine the modulus of sub-grade reaction with respect to standard plate.

Load kg	0.00	460	900	1180	1360	1480	1590	1640
Mean settlement mm	0.00	0.24	0.52	0.76	1.02	1.23	1.53	1.76

Table Q5(b) **(07 Marks)**

c. Explain briefly about different types of bituminous mixes used in flexible pavements. **(06 Marks)**

OR

6 a. Explain briefly about Highway Research Board (HRB) soil classification. **(07 Marks)**

b. Explain briefly about desirable properties aggregates used in highway pavement. **(06 Marks)**

c. Explain briefly about various steps involved in the construction of flexible pavement. **(07 Marks)**

Module-4

7 a. Explain briefly about desirable requirements of highway drainage. **(06 Marks)**

b. Explain briefly about the choice and location of cross drainage structures in the highway pavements. **(07 Marks)**

c. Explain briefly about various factors affecting the vehicle operation cost. **(07 Marks)**

OR

8 a. Explain briefly about importance of drainage system in highways. **(06 Marks)**

b. Explain briefly about tangible and intangible highway user benefits. **(07 Marks)**

c. Calculate the annual cost of a stretch of highway project having following : Particulars, as shown in Table Q8(c).

Sl.No.	Description of the item	Total, cost in 'Rs' (lakhs)	Estimated life in years	Rate of interest %
1	Land	35.00	100	6.00
2	Earth work	40.00	40	8.00
3	Bridges, culverts and drainage	50.00	60	8.00
4	Pavement	100.00	15	10.00
5	Traffic signs and road appurtenances	15.00	5	10.00

Table Q8(c).

Consider the average annual maintenance cost as Rs. 1.50 lakhs. **(07 Marks)**

Module-5

9 a. Explain briefly about different vehicular characteristics which affect road design. **(07 Marks)**

b. Explain briefly about coning of wheels and importance of canting of rails in railways. **(06 Marks)**

c. Explain briefly about site selection for airport. **(07 Marks)**

OR

10 a. Explain briefly about traffic regulations and control. **(06 Marks)**

b. Explain briefly about various railway track components with the aid of a neat sketch. **(07 Marks)**

c. Explain briefly about different components of airport. **(07 Marks)**

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