

May-25-0367

CE-506 (Transportation Engineering-I)

B.Tech. 5th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question each from section ABCD. Question no. 9 Section E is compulsory, which is of 20 marks.

SECTION - A

1. (a) Explain briefly the classification of highways by Nagpur Road Plan. How is this system of classification modified as per the third twenty year road development plan? (5)
- (b) What are the various road patterns practiced? Explain in detail. (5)

OR

2. (a) What are the objectives of traffic volume studies and discuss about the role of 30th hourly volume? (5)
- (b) Explain spot speed, running speed, space mean speed, time mean speed and average speed. How does the spot speed study carried out? (5)

SECTION - B

3. While aligning a highway in a built up area, it was necessary to provide a horizontal circular curve of radius 446 m. The design speed is 85 kmph, the length of wheel base is 8m and the pavement width is 12m. Design super elevation, extra widening and length of transition curve. (10)

OR

4. A vertical summit curve is formed when an ascending gradient of 1 in 40 meets a descending gradient of 1 in 80. Find the length of summit curve to provide the required stopping sight distance for a design speed of 80 kmph. (10)

SECTION - C

5. (a) What is the difference between Cutback and Emulsion? Discuss about the tests to be organized for deciding the suitability of Bitumen in road construction. (5)
- (b) Explain the desirable properties of aggregates as a highway material. (5)

OR

6. Design the flexible pavement for the construction of a new highway with the following data (Follow guidelines as per IRC 37 2012):
Category of road - Four lane dual carriageway
Number of commercial vehicles in the year of completion of construction - 2400
CVPD per direction
Annual growth rate of commercial vehicles - 5%
Design life - 15 years
Design CBR value of subgrade soil - 5%
Vehicle damage factor - 3.5 Lane distribution factor - 0.75
For CBR 5%

Traffic (msa)	GSB (mm)	GB (mm)	DBM (mm)	BC (mm)
5	250	250	55	25
10	300	250	70	40
20	300	250	100	40
30	300	250	120	40
50	300	250	125	50
100	300	250	130	50

(10)

[P.T.O.]