

B.E. Third Semester (Second Year) (Civil) (Part Time) (Annual Pattern) (CGS)
Transportation Engineering - I : 3 CE 03

P. Pages : 2

Time : Three Hours



AU - 3525

Max. Marks : 80

- Notes :
1. All question carry marks as indicated.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answer necessary with the help of neat sketches.
 6. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) What is the importance of Nagpur road plan in highway planning of our country? Explain the plan formula. 7

- b) Explain the desirable properties of aggregate to be used in different pavement construction. 6

OR

2. a) Discuss briefly the historical development of road construction. 7

- b) Compare alternate bay and continuous bay method of cement concrete roads. 6

3. a) Derive an expression for finding the super elevation.

- b) What are the factors on which the SSD depends? Determine the minimum non passing sight distance that should be provided for a vehicle coming down a 6% gradient. Given the following data :

i) Design speed = 65 kmph.

ii) Reaction time of driver = $\frac{220}{50 + V}$ sec, V in kmph.

iii) Coeff. of friction between tyre and road surface = 0.5

OR

4. a) How the length of summit curve is decided? Explain. 7

- b) What is off - tracking? Calculate the extra width of pavement required on a horizontal curve of radius 700 m on a two lane highway, the design speed being 80 kmph. Assume wheel base L = 6 m. 7

5. a) Compare Flexible and Rigid Pavements. 6

- b) Discuss the IRC recommendation for determining thickness of cement concrete pavements. 7

OR

6. a) Enumerate the steps in the construction of water bound macadam roads. 6
- b) Explain CBR method of pavement design and calculate the thickness of pavement from the following data : 7
- i) CBR value of subgrade soil = 8%
- ii) Wheel load = 3175 kg
- iii) Tyre pressure = 5 kg/cm^2 .

SECTION - B

7. a) What are the various uses of speed and delay studies? Explain how speed and delay studies are carried out. 7
- b) Enumerate the various types of inter sections and the basic principle involved. 6

OR

8. a) What are different vehicular characteristics which affect the road design? Explain briefly. 7
- b) What are the advantages and disadvantages of traffic signals? 6
9. a) Explain in brief recommended practice for site exploration and soil investigations for bridges. 7
- b) What is economic span of bridge? Derive the expression for the economic span. 7

OR

10. a) Under what conditions a well foundation is suitable? Describe components of the same and operation involved in sinking of well foundation. 7
- b) Discuss bearings in bridges, their purpose and types. 7
11. a) Explain briefly the Rational method for fixing the design discharge of a stream. 7
- b) Give IRC recommendations for wind and impact loads for bridges. 6

OR

12. a) What is strengthening of bridge? What are the various methods of strengthening. 7
- b) A bridge is proposed to be constructed across an alluvial stream carrying a discharge of $350 \text{ m}^3/\text{sec}$. Assuming value of silt factor as 1.0, determine the maximum scour depth when the bridge consist of 6
- i) 2 spans of 40 m each
- ii) 3 spans of 30 m each
