[5871]-502

B.E. (Civil)

TRANSPORTATION ENGINEERING

(2015 Pattern) (Semester - I)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q.No.1 or Q.No. 2, Q.No.3or Q.No.4, Q.No.5 or Q. No.6, Q.No.7 or Q.No.8, Q.No.9 or Q.No.10.*
2) *Figures to the right indicate full marks.*
3) *Use of logarithmic tables, slide rule, Mollies charts, electronics pocket calculator and steam tables is allowed.*
4) *Assume suitable data if necessary.*
5) *Neat diagrams must be drawn wherever necessary.*

Q1) a) Roads are the arteries of the nation, on which prosperity of nation spread "comment"? **[5]**

b) Discuss the second twenty year road development plan and its salient features? **[5]**

OR

Q2) The radius of horizontal curve is 400 m, the total pavement width at curve is 7.6 m and the super elevation is 0.07. Design the transition curve length for speed of 100 Kmph. **[10]**

Q3) a) Find the stopping sight distance on a highway at a descending gradient of 1 in 40 for a design speed of 65 Kmph. Assume other data as per IRC recommendations **[5]**

b) Enlist various methods of conducting the Origin and Destination Studies and explain any one in brief. **[5]**

OR

Q4) a) Explain the importance of highway drainage in increasing the serviceability of the road **[5]**

b) Estimate the basic capacity of traffic lane at a speed of 60 Kmph. Assume that all the vehicles are of average length of 6.0 m **[5]**

P.T.O.

Q5) a) How are Cutbacks prepared? What are the different types of Cutbacks? State their advantages. **[6]**

b) Explain in brief the procedure of conducting 'Ductility Test' on bitumen. **[6]**

c) Write a note on types of Bitumen. **[5]**

OR

Q6) a) Explain briefly the Marshall method of bituminous mix design. **[6]**

b) How is foamed bitumen produced? state where they can be used. **[6]**

c) Write a note on Polymer Modified Bitumen. **[5]**

Q7) a) Calculate the cumulative number of standard axles for a design of new flexible pavement for a two lane undivided carriage way using the following data: **[6]**

i) Subgrade soil CBR = 5.0%

ii) No of heavy vehicles per day in september 2014 = 150

iii) Design life = 15 years

iv) Annual rate of increase in the heavy vehicles = 5.0%

v) Vehicle Damage Factor = 3.5

vi) Lane Distribution factor = 0.75

The road is proposed to be completed in September, 2019

b) Explain the concept of ESWL with a neat sketch. **[6]**

c) Differentiate between flexible and rigid pavements **[5]**

OR

Q8) a) What is CBR? Calculate the CBR value of a soil sample, if the load sustained by specimen at 2.5 mm and 5.0 mm penetration is recorded as 62.7 kg and 91.2 kg respectively. **[6]**

b) Discuss in brief load stresses acting on a rigid pavement. **[6]**

c) Define 'Vehicle Damage Factor'. Explain its importance in the design of flexible pavement. **[5]**

Q9) a) Differentiate between Cold Mix and Hot Mix Asphalt Technology. **[5]**

b) Explain in brief the construction process of Bituminous Macadam (BM) **[6]**

c) Explain the importance of providing prime Coat, tack coat and seal coat in pavements. **[5]**

<div align="center">OR</div>

Q10)a) Write a note on Dry Lean Concrete? **[5]**

b) How is the structural evaluation of pavement done using FWD? **[6]**

c) Explain how WMM layer is prepared in the field. **[5]**

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