Total No. of Questions : 8]

SEAT No. :

PC-2342

[Total No. of Pages : 2

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B.E. (Civil Engineering)
TRANSPORTATION ENGINEERING
(2019 Pattern) (Semester - VII) (401002)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q1or Q2, Q3 or Q4, Q5 or Q6, Q7or Q8.***
2) ***Figures to the right indicate full marks.***
3) ***Use of electronic pocket calculator is allowed.***
4) ***Assume suitable data if necessary.***
5) ***Neat diagrams must be drawn wherever necessary.***

Q1) a) The horizontal curve of radius 180 m is having design speed of 60 kmph. The design coefficient of lateral friction is 0.15. **[6]**

i) Calculate required super elevation if full lateral friction is assumed to develop.

ii) Calculate required coefficient of friction if super elevation is not provided.

b) Draw a neat cross section of MDR in cutting in rural area. **[6]**

c) Define Camber, Shoulder, Kerb, Right of way, Width of formation, and Sight Distance. **[6]**

OR

Q2) a) The speeds of overtaking and overtaken vehicles are 80 kmph and 50 kmph respectively on a two way traffic road. The average acceleration during overtaking can be assumed as 0.99 m/s^2 **[6]**

i) Calculate safe overtaking sight distance

ii) What is minimum length of overtaking zone?

b) What is effect of gradient on overtaking sight distance? **[6]**

c) What is overturning effects? Explain with a neat sketch. **[6]**

P.T.O.

Q3) a) Explain role of bituminous binder in construction of highway. **[6]**

b) Define Elongation Index (EI). How EI is determined in the laboratory. **[6]**

c) Explain significance of Marshall method of bituminous mix design. **[5]**

OR

Q4) a) Explain in brief types of tests to be carried out to select the suitable grade of bitumen. **[6]**

b) What is Angularity number? Give its significance in highway construction. **[6]**

c) What is significance of aggregate gradation in design of non bituminous layer of flexible pavement? **[5]**

Q5) a) Explain basic concepts in analysis of various stresses in Rigid Pavements. **[6]**

b) Differentiate temperature stresses and wheel load stresses. **[6]**

c) What is dowel bar in rigid pavement? Explain its role with respect to functioning stresses. **[6]**

OR

Q6) a) Classify different types of joints in rigid pavements and mention objectives of each. **[6]**

b) What are the factors causing warping stresses in cement concrete pavements? Explain. **[6]**

c) Differentiate rigid pavement and flexible pavement with a neat sketch. **[6]**

OR

Q7) a) Discuss various factors that engineer will consider in site selection for a bridge on a major river? **[8]**

b) Define Abutment. State the various types of abutments. **[4]**

c) What are the requirements of an ideal permanent way? **[5]**

OR

Q8) a) What are the advantages and disadvantages of temporary bridges? **[8]**

b) Differentiate between skew bridge and submersible bridge. **[4]**

c) What are the types of R.C.C bridges? Draw sketch of any one with neat labeling. **[5]**