Total No. of Questions : 10]

SEAT No. :

P3233

[Total No. of Pages : 3

[4859] - 1002

B.E. (Civil) (Semester End)

TRANSPORTATION ENGINEERING

(2012 Pattern)

Time : 2.5 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q. 1 or Q. 2, Q. 3 or Q. 4, and Q. 5or Q. 6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables, slide rule, Mollies charts, electronics pocket calculator and steam tables is allowed.***
5) ***Assume suitable data if necessary.***
6) ***Neat diagrams must be drawn wherever necessary.***

Q1) a) The area of Maharashtra is 3,08,000 Sq. Km and there are 276 Towns as per 1981 census. Determine the lengths of different categories of roads to be provided in the state by the year 2001. **[5]**

b) Explain Obligatory points. With sketches discuss how these controls alignment. **[5]**

OR

Q2) a) In a braking test, a vehicle travelling at a speed of 40 kmph was stopped by applying brakes fully and the skid marks were 8.5 m in length. Determine the average skid resistance of the pavement surface. **[5]**

b) Explain with the help of neat sketches the methods of eliminating camber and introduction of superelevation. **[5]**

Q3) a) Enumerate the steps for practical design of Super elevation considering mixed traffic condition. **[5]**

b) Discuss in brief the factors affecting the design of rigid pavement. **[5]**

OR

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Q4) a) Design a valley curve at the junction of a downward gradient of 1 in 30 and a level stretch from head light consideration. The stopping sight distance is 180 m. **[5]**

b) Discuss in brief warping stresses and Frictional stresses in rigid pavement. **[5]**

Q5) a) Explain in brief the following : **[2+2+2=6]**

i) Wind Rose Type 1

ii) Taxiway

iii) Airport Capacity

b) Explain the characteristics of good airport layout. Draw a neat sketch of typical airport layout of single runway. **[4+2=6]**

c) How Runway orientation should be done. ? Discuss. **[4]**

OR

Q6) a) Enlist and explain in brief the various aircraft characteristics. **[2+4=6]**

b) Explain the following terms : **[2×3=6]**

i) Hanger

ii) Minimum Circling radius

iii) Calm period

c) Explain in brief the advantages and limitation of air transportation. **[2+2=4]**

Q7) a) State the various methods commonly used in estimation of flood discharge at a bridge site. How is the Linear Waterway of a bridge is fixed. **[2+4=6]**

b) Calculate the flood discharge from the catchment of 65 Square Kilometers when the rainfall during the storm was 15cm. in two hours. The Time of concentration is 20 hours and the runoff coefficient for the catchment is 0.35. **[4]**

c) What is scour depth? State the factors upon which pattern of scour depend. Why allowance should be made in the observed scour depth. **[2+2+2=6]**

OR

Q8) a) What is mean by Afflux? How does the magnitude of afflux influence the design? **[2+4=6]**

b) Determine the waterway of the bridge across a stream with a flood discharge of 300 m^3 / sec., velocity 1.5 m/ sec and width of flow at high flood level is 70 m. The allowable velocity under bridge is 1.8 m/ sec. Assume permissible safe velocity under the bridge is equal to 90 % of allowable velocity under the bridge. **[4]**

c) Derive an equation for Economical span of a bridge. State the assumptions clearly. **[4+2=6]**

Q9) a) Define Pier. State the various types of piers Also State the requirements of good pier. **[2+2+2=6]**

b) What is Cut water and Ease Water? Why it is necessary? Sketch any two shapes of Cut water and Ease Water. **[2+2+2=6]**

c) Write a short note on Erection and Maintenance of Bridges. **[6]**

OR

Q10 a) How will you account for the following in the design of Highway Bridge. **[2+2+2=6]**

i) Centrifugal Force

ii) Earthquake Force

iii) Wind Load

b) Define Bridge bearing. State the types of bearings. Why Bearings are necessary in bridges. **[2+2+2=6]**

c) Explain the following with a neat sketches : **[2+2+2=6]**

i) Arch culvert

ii) Balanced Cantilever bridge

iii) Traverser bridge

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