

Total No. of Questions : 10]

SEAT No. :

P2111

[Total No. of Pages : 3

[5254]-502

B. E. (Civil)

TRANSPORTATION ENGINEERING

(2012 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4 and Q.5 or 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, Molliés 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) State comparison between Nagpur road plan and Bombay Road plan. [5]  
b) Explain in brief the factors controlling an highway alignment. [5]

OR

- Q2)** a) Explain in brief the following : [5]  
i) PCU ii) O and D Survey  
b) Define Unevenness Index. Explain in brief how it is measured [5]

- Q3)** a) Design the superelevation required for a road curve of 240 m radius with mixed traffic conditions. The design speed is 80 Km/h. The coefficient of friction is 0.15. The road is passing through rolling terrain. [5]  
b) Write a short note on Marshall Stability Test [5]

OR

- Q4)** a) Draw a neat cross section of flexible pavement. Explain in brief functions of various layers of flexible pavement [5]  
b) The CBR value of the subgrade is 6 percent. Calculate the total thickness of pavement using design formula developed by U.S. Corps of Engineers. Assume wheel load = 4082 Kg. Tyre pressure = 7 Kg/cm<sup>2</sup>. [5]

P.T.O.

- Q5) a)** Draw a neat sketch showing the component parts of aeroplane. [6]  
b) Write a note on Basic Runway length and Orientation of Runway. [3+3=6]  
c) How is the minimum turning radius is decided [4]

OR

- Q6) a)** How can the plotting of wind rose diagram can be done [6]  
b) Explain in brief the following : [2×3=6]  
i) Holding Apron  
ii) Tricycle undercarriage  
iii) Instrument runway  
c) What are the factors which influence the location of an airport. [4]

- Q7) a)** Explain in brief the following : [6]  
i) Submersible Bridge ii) Class B Bridge  
iii) Skew Bridges iv) Through Bridges  
b) What is Afflux? How it is estimated. [6]  
c) Explain in brief the significance of following terms in bridge design: [2 + 2 + 2 = 6]  
i) Clearance above HFL  
ii) Size of opening  
iii) Fixing waterway

OR

- Q8) a)** Calculate the peak runoff for designing a bridge across a stream, given Catchment Length = 6 Km; H= 25 m; Area of catchment(A) = 10 sq km; Runoff coefficient = 0.285; The severest storm in 20 years dropped 15cm rain in 2.5 hours ;Type of catchment = Loamy soil largely cultivated. [6]  
b) How would you estimate the maximum scour depth for any bridge pier. [6]  
c) Write a short note on determination of velocity of stream by Surface Float method. [6]

**Q9) a)** How will you account for the following in the design of highway bridge: **[2 × 3 = 6]**

- i) Dead Load
- ii) Earth pressure
- iii) Erection stresses

**b)** What do you understand by fixed span bridges? Explain any two types of fixed span bridges with the help of neat sketch **[2 + 2 + 2 = 6]**

**c)** Discuss in brief the following : **[2 + 2 = 4]**

- i) Causeway
- ii) Pontoon Bridges

OR

**Q10)a)** Explain with a neat sketch the following: **[3 + 3 = 6]**

- i) Pile Bent Pier
- ii) Splayed wing Wall

**b)** State merits and demerits of Continuous Bridges. **[6]**

**c)** Write a note on maintenance and preservation of Steel bridges. **[4]**

