Total No. of Questions : 10] **SEAT No. :**

P3016 **[Total No. of Pages : 3**

[5354]-502
B.E. (Civil)
TRANSPORTATION ENGINEERING
(2012 Pattern)

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, 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) Discuss briefly the contribution of Jaykar Committee in the development of roads of India. **[5]**

b) State with reasons the various traffic studies necessary to be conducted for widening of existing roads. **[5]**

OR

Q2) a) Explain in brief on-street parking and off-street parking. **[5]**

b) Explain in brief how the super elevation is provided in the field. **[5]**

Q3) a) Determine the extra widening required for a vehicle negotiating a curve of radius 300 m, moving with a design speed of 60 Kmph on a two lane road. Take length of wheel base is equal to 7.0 m. **[6]**

b) Explain in brief Flash and Fire Test on Bitumen. **[4]**

OR

Q4) a) A vertical summit curve is formed at the intersection of two gradients, +4% and – 6%. Design the length of the summit curve to provide a stopping sight distance for a design speed of 80 Kmph. Assume any other data suitably. **[6]**

P.T.O.

b) Write short notes on : **[4]**

i) Cutbacks

ii) Camber

Q5) a) The length of the runway under standard conditions is 1200 m. The airport has an elevation of 250 m above mean sea level. Its reference temperature is 32° C. If the runway is to be constructed with an effective gradient of 0.20% Determine the corrected runway length. **[10]**

b) Explain how orientation of runway is done using the Wind Rose Type I diagram. **[6]**

OR

Q6) a) Draw a neat sketch of an aircraft showing all the component parts. **[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) A bridge is proposed to be constructed across an alluvium stream carrying a discharge of 300 m^3/s. Assume silt factor, f = 1.10, determine the maximum scour depth when the bridge consists of 5 spans of 20 m each. **[6]**

b) What is Afflux? How it is estimated **[5]**

c) Describe with the help of an illustrative sketch. **[5]**

i) Splayed wing wall

ii) Column Bent pier

OR

Q8) a) The normal velocity of flow in a river is 2 m/s. The normal and artificial waterway under the bridge is 9000 m^2 and 7000 m^2 respectively. Determine the height of afflux using Molesworth formula. **[5]**

b) Derive the equation for economical span of the bridge. **[5]**

c) Write short notes on: **[6]**

i) Forces due to water current

ii) IRC class A Loading

Q9) a) From the following data, calculate the linear waterway required for a bridge to be constructed across the river. **[6]**

Catchment area = 1000 ha

Maximum intensity of rainfall = 1 cm/hr

Runoff coefficient = 0.6

Average depth of flow = 1.5 m

Permissible velocity of flow = 1.2 m/s

b) Differentiate between temporary and permanent bridges with the help of an example. **[6]**

c) Describe with the help of neat sketches: **[3+3=6]**

i) Bascule Bridge

ii) Pontoon Bridge

OR

Q10) a) Differentiate between Cable Stayed Bridge and Suspension Bridge. **[3+3=6]**

b) State the purposes of providing bearing in bridges. Describe any one type of bearings. **[4+2=6]**

c) Explain in brief the procedure for erection of Steel bridges. **[6]**