Total No. of Questions : 10]

SEAT No. :

P2950

[Total No. of Pages : 3

[5154]-502
B.E.(Civil)
Transportation Engineering
(2012 Pattern) (End Sem.) (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) ***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) Discuss briefly the various road patterns. Draw a neat sketch to justify your answer. **[3+2=5]**

b) Enlist the various surveys carried out for highway location. Explain any two in brief. **[2+3=5]**

OR

Q2) a) Explain in brief the following: **[5]**

i) Passenger Car Unit.

ii) Traffic Signs

b) Define Passing Sight Distance. Why it is necessary? State the factors governing the PSD. **[1+2+2=5]**

Q3) a) Determine the height of the crown with respect to the edges of the road in the following cases: **[5]**

i) WBM road 3.8 m wide in areas of low rainfall

ii) Concrete road 7.0 m wide in areas of heavy rainfall

b) Discuss in brief Extraction test on bituminous mix and its significance in quality control. **[4+1=5]**

OR

P.T.O.

Q4) a) The CBR value of subgrade soil is 5.0%. Calculate the total thickness of pavement using design formula developed by U.S. Corps of Engineers. Assume wheel load of 4082 kg. Tyre pressure of 7 kg/cm^2. **[5]**

b) Explain in brief the following: **[5×1=5]**

i) Seal coat

ii) Mastic Asphalt

iii) Emulsion Bitumen

iv) Dowel bar

v) DBM

Q5) a) Explain in brief the following: **[4×1.5=6]**

i) Flaps

ii) Fuselage

iii) Tricycle undercarriage

iv) Control tower

b) Distinguish clearly between Minimum Circling radius and Turning radius. **[3+3=6]**

c) Write a short note on Wind Rose Diagaram type II **[4]**

OR

Q6) a) What do you mean by Airport capacity? State the various factors affecting airport capacity. **[2+4=6]**

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

i) Holding apron.

ii) Cross Wind Component.

iii) Calm period.

c) Draw a neat sketch of an aeroplane and show various component parts. **[1+3=4]**

Q7) a) Derive the Rational formula for determination of discharge for small culverts. Use usual notations. **[4]**

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

i) Quasi alluvial stream

ii) Artificial waterway area

iii) Permissible velocity of flow

c) What is free board? Why it is provided? Draw a neat sketch to justify your answer. **[2+2+2=6]**

OR

Q8) a) A bridge is proposed across an alluvial stream (*f=1.2*) carrying a discharge of 500 m^3/s. Calculate the depth of maximum scour when the bridge consist of 5 spans of 15 m each. **[6]**

b) Define Economic Span. Derive an equation for economical span. **[1+5=6]**

c) Explain with a neat sketch Afflux and its significance in bridge design. **[2+2=4]**

Q9) a) The catchment area of a stream is of sandy soil with light vegetation cover and the area of the catchment is 15000 hectares. The length of the catchment is 26 km and the fall in level from the critical point to the bridge site is 185 m. Calculate peak runoff for designing the bridge if the severest storm recorded yielded 18 cm of rain in 4 hours. Assume value of area factor is equal to 0.70 and coefficient to account for losses due to absorption is 0.20 **[6]**

b) Explain with a neat sketch following: **[3×2=6]**

i) Balanced cantilever bridge

ii) Arch culvert

iii) Swing bridge

c) Discuss in brief the following: **[3×2=6]**

i) Earth pressure.

ii) Wind Load.

iii) Forces due to water current.

OR

Q10)a) State the various purposes of providing bridge bearings.Distinguish between Fixed bearing and Expansion bearing. **[3+3=6]**

b) Define Pier. Draw a neat sketch of the Hammer head shape pier and Multiple bent pier. **[2+2+2=6]**

c) Explain in brief the need of maintenance and strengthening of existing old bridges. **[6]**

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