END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2016

Paper Code: ETCE 312   Subject: Transportation Engineering -I

Time : 3 Hours   Maximum Marks :75

**Note: Attempt any five question including Q.No. 1 which is compulsory.
Select one question from each unit. IRC-37 and 58 are allowed.**

(5x5=25)

Q1. Answer **any five**:

a) Write standards for different camber in highway engineering.

b) What is grade compensation in high way engineering?

c) What are factors on which S.S.D depends?

d) What is overtaking zone?

e) State the concept of any method of pavement evaluation.

f) Why are joints provided in cement concrete road?

g) Define the concept of CBR.

Unit-I

Q2. Briefly describe the process of engineering surveys for a highway alignment through conventional and modern methods. **(12.5)**

Q3. Calculate the absolute minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 100km/h and 80km/h. Assume a reaction time of 2.5 seconds, coefficient of friction of 0.85 and brake efficiency of 50percent, in either case. **(12.5)**

Unit-II

Q4. a) Explain spot speed, running speed, space mean speed, time-mean speed and average speed. **(6)**

b) What are various objectives and applications of spot-speed studies? **(6.5)**

Q5. a) Estimate the basic capacity of traffic lane at a speed of 60kmph. Assume that all the vehicles are of average length 6m. **(6)**

b) What are the various types of traffic markings commonly used? What are the uses of each? **(6.5)**

Unit-III

Q6. Calculate the stresses in rigid pavement from the following data:

Thickness of the slab, h= 30cm

Size of the slab = 4.5x3m

Sub-grade CBR = 10%

Design of wheel load= 5100 kg

Radius of contact area, a =15cm

Find the stresses at interior, edge and corner as per wastergaard's formulas. **(12.5)**

P.T.O.

Q7. a) How will you find the CBR of a subgrade soil in a laboratory? Give a critical appraisal of the CBR method of design of flexible pavement. **(6)**

b) What are requirements of good aggregates used in bituminous construction? How do the aggregate properties affect the service behavior of bituminous surfacing? **(6.5)**

Unit-IV

Q8. Write notes on the following: **(4x2=8)**
a) (i) Map cracking (ii) Mud pumping
(iii) Skidding of pavement surface (iv) Bitumen

b) State the basic principle of deflection studies using Benkelman beam. **(4.5)**

Q9. Discuss the following procedures for flexible pavement evaluation. **(12.5)**
Benkelman beam deflection studies
Estimation of unevenness index
Pavement serviceability index
Present serviceability rating

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