Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards E-I & II) (Sem.–7,8)

PAVEMENT DESIGN

Subject Code : BTCE-818

Paper ID : [A2972]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.
4. Use of IRC:37-2012 and IRC:58-2011 is allowed.

SECTION-A

Q1. Answer briefly :

a) What do you mean by Semi rigid pavements?

b) What are the various strength tests conducted for the evaluation of soil subgrade?

c) Give advantages of CBR method of design.

d) What are the components of superpave system?

e) Name various mix design methods.

f) Define ESWL.

g) Which factors affect the thickness of pavement in Triaxial test method?

h) How is the subgrade support (S) calculated in McLeod's method?

i) What do you mean by perpetual pavement?

j) Explain in brief ultrathin white topping.

SECTION-B

Q2. Explain Flexible and Rigid pavements and bring out the points of difference between them.

Q3. A subgrade soil has following properties :

Soil passing 0.075 mm sieve= 60%, Liquid limit= 55%, Plastic limit= 45%. Design the pavement section by GI method for heavy traffic with over 400 commercial vehicles per day.

Q4. Determine the thickness of concrete overlay as per the US Corp of Engineers method over an existing concrete pavement 15 cm thick which is in a good condition. It has been found that a new slab of 20cm is needed. Also calculate the overlay thickness if the slab is badly cracked.

Q5. Explain how the dimensions and spacing of tie bars are designed.

Q6. Explain briefly the Marshall method of design.

SECTION-C

Q7. Design the CC pavement thickness, expansion and contraction joint spacing, dowel and tie bars for a wheel load of 5100kg.

Q8. Calculate the stresses at interior, edge and corner of a cement concrete pavement by Westergaard's stress equation. Given, Modulus of elasticity of concrete = 3×10^5 kg/cm^2, Poisson's ratio of concrete = 0.15, thickness of concrete pavement = 18cm, Modulus of subgrade reaction = 8.5kg/cm^2, Wheel load = 5100kg, Radius of loaded area = 15cm.

Q9. Explain in detail the requirements of airport pavement.