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M.Tech. (Civil Engg) (2016 Onwards) (Sem.-1)

PAVEMENT DESIGN

Subject Code : MTCE-203

M.Code : 74239

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) Explain flexible and rigid pavement and bring out the points of difference. (12)

   b) Draw a sketch of flexible pavement cross section and show the component parts. (8)

2. The following results were obtained when plate load tests were collected using a 30 cm diameter plate.

Pressure applied (kg/cm2)	Deflection (mm)
On sub grade 1.5	2.5 2.5
On 15 cm axial 4.0 base course	

   Estimate the modulus of elasticity of the sub grade and the base course material. Find the thickness of the base course required to bear a wheel load or 4000 kg with a tyre pressure of 5.00 kg/cm2. Assume an allowed deflection of 5mm. (20)

3. a) Differentiate between plain and Rubber Modifie Modifiers. (10)

   b) How does Poisson's ratio influence the stresses in rigid and flexible pavements? (10)

4. a) Discuss the necessity of providing expansion joint in pavements. (10)

   b) Write short note on pavement distress and remedial measures. (10)

5. a) Differentiate between frost heaving and shear failure of flexible pavements. (10)

   b) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. (10)

6. Calculate the stresses due to wheel load at edge of a cement concrete pavement by Westergaurd's method using the following data:

Modulus of elasticity of concrete :	3 ×105 kg/cm2
Poisson's ratio of concrete :	0.15
Modulus's sub grade reaction :	2.5 kg/cm3
Thickness of concrete pavement :	18 cm
Wheel load :	4100 kg
Radius of contact area :	12 cm

(20)

7. Write short notes on the following :

a) Alligator cracking (5)

b) Scaling of cement concrete (5)

c) Overlay for a flexible pavement (5)

d) Expansion joint (5)

8. Explain the procedure for the Life Cycle Cost Analysis of Pavements. What are your recommendations? (20)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.