



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April 2016
(2008 Scheme)**

08.806.3 : Elective – IV : DESIGN AND CONSTRUCTION OF PAVEMENTS (C)

Time : 3 Hours

Max. Marks : 100

- Instructions :** 1) Answer **all** questions from Part A and **one full** question from **each** Module in Part B.
2) Assume suitable data if **necessary**.

PART – A

(5 Marks each)

- I. 1) What are the differences between highway and airfield pavement ?
2) Explain various factors to be considered for the choice of pavement types.
3) What are the limitations of group index method ?
4) Explain the terms radius of relative stiffness and radius of resisting section.
5) Discuss the design procedure of tie bars.
6) Write short note on pavement roughness measurement.
7) Explain Present Service ability Index.
8) Discuss the CBR method of flexible pavement design.

PART – B

Module – I

- II. A) Discuss the effects of repeated load applications on pavements. Explain equivalent wheel load factor for load repetitions. **10**
B) Explain with neat sketches the step by step procedure of finding modulus of subgrade reaction using plate bearing test. **10**

OR

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- III. A) Explain the concept of ESWL based on both equal deflection criteria and equal stress criteria. 10
- B) The loaded weight on the rear dual wheel loads of a truck is 50 kN. The centre to centre spacing and clear space in the dual wheels are 300 mm and 100 mm respectively. Calculate the ESWL for pavements of thickness (i) 250 mm and 500 mm by graphical method. 10

Module – II

- IV. A) Calculate the stresses at interior, edge and corner of a cement concrete pavement by Westergaard's stress equations.
- | | | | |
|------------------------------|---|--|----|
| Modulus of elasticity | – | 3.3 × 10 ⁵ kg/cm ² | |
| Poisson's ratio | – | 0.15 | |
| Thickness of pavement | – | 20 cm | |
| Modulus of subgrade reaction | – | 2.5 kg/cm ³ | |
| Wheel load | – | 4050 kg | |
| Radius of loaded area | – | 14 cm. | 16 |
- B) Explain the critical combination of stresses in rigid pavements. 4

OR

- V. A) Design the size and spacing of dowel bars at the expansion joint of a cement concrete pavement of thickness 25 cm with radius of relative stiffness 80 cm for a design wheel load of 5000 kg. Assume load capacity as 40% of design wheel load. Joint width 2.0 cm. Permissible shear and flexural stresses in dowel bar are 1000 kg/cm² and 1400 kg/cm² respectively and permissible bearing stress in cement concrete is 100 kg/cm². 10
- B) Determine the spacing between contraction joints for 3.5 m width slab having thickness of 20 cm and coefficient of friction $f = 1.5$ for the following two cases.
- 1) Plain concrete with allowable stress in tension in concrete is 0.8 kg/cm².
 - 2) Reinforced cement concrete slab with 1 cm dia. bars at 0.3 m spacing. 10



Module – III

- VI. A) Explain the construction procedure of wet mix macadam, bituminous concrete and bituminous macadam.
- B) Explain various cross drainage works. **20**
- OR
- VII. A) Explain various pavement evaluation methods.
- B) What are the components of pavement management system? **20**
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