



Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, October 2014  
(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**

- I. a) What are the functions of different layers in a flexible pavement ?
- b) Why and how seal coat is used in pavements ?
- c) Explain equivalent single wheel load.
- d) Explain the various design factors considered in airfield pavement thickness.
- e) Explain Bradbury's stress coefficients for rigid pavement design.
- f) Discuss the necessity for dowel bars in rigid pavements.
- g) Explain the components of Pavement Management System.
- h) Discuss the construction procedure for premix carpet. **(5×8=40 Marks)**

**PART – B****Module – I**

- II. a) Explain in detail the factors involved in the design of flexible pavements.
- b) Benkelman beam deflection studies were carried out on 15 selected points on a stretch of flexible pavement during summer season using a dual wheel load of 4085 Kg, 5.6 Kg/cm<sup>2</sup> pressure. The deflection values obtained in mm after necessary corrections are given below. If the present traffic consist of 800 CVPD, Determine the thickness of bituminous overlay required, if the pavement temperature during the test was 39°C and correction factor for subsequent increase in subgrade moisture content is 1.3. Assume annual rate of growth of traffic as 7.5%. Adopt IRC guidelines.

1.40, 1.32, 1.25, 1.35, 1.48, 1.60, 1.65, 1.55, 1.45, 1.40, 1.36, 1.46, 1.50, 1.52, 1.45 mm.

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OR

- c) Explain any two empirical design method for flexible pavement design.
- d) Discuss in detail the types of pavements and discuss the IRC method of flexible pavement design.

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**Module – II**

- III. a) Explain in detail the step wise procedure for IRC method of design for rigid pavements.
- b) A cement concrete pavement has a thickness of 18 cm and has two lanes of 7.2 m with a longitudinal joint along the centre. Design the dimensions and spacing of the tie bar. Allowable working stress of steel in tension = 1400 kg/cm<sup>2</sup>, unit weight of concrete = 2400 kg/cm<sup>2</sup>, coefficient of friction = 1.5, allowable bond stress in deformed bars in concrete = 24.6 Kg/cm<sup>2</sup>.

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OR

- c) Discuss in brief what are the critical positions in a rigid pavement. Elaborate some of the important methods used for the design of rigid airfield pavement.
- d) Explain the temperature stresses on rigid pavements.

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**Module – III**

- IV. a) Explain the construction procedure for Bituminous Macadam with specification of materials, plant requirements and gradation of aggregates.
- b) Explain the significance and requirements of a highway drainage system. **20**

OR

- c) Explain the functional and structural evaluation of pavements.
- d) The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is  $0.9 \text{ m}^3/\text{sec}$ . Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0 m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 1.2 m/sec. and Manning's roughness coefficient is 0.02. **20**