



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April/May 2012
(2008 Scheme)**

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

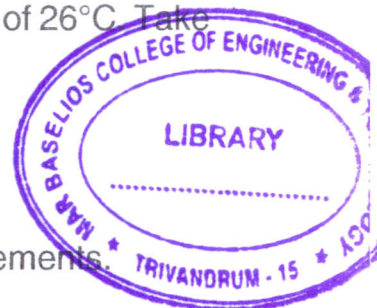
Time : 3 Hours

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) Distinguish between Flexibles Rigid and composite pavement.
- b) List the factors affecting pavement design.
- c) What are the assumptions made in the Burmisters method of design ?
- d) Briefly explain the design parameters in Westergaards analysis of stresses in Rigid pavements.
- e) Design the spacing of expansion joints for a cement concrete pavement with expansion gap of 2.2 cm and maximum change in temperature of 26°C. Take thermal coefficient of concrete as $10 \times 10^{-6}/^{\circ}\text{C}$.
- f) Explain briefly the requirements of airport pavements.
- g) Explain the construction procedure of bituminous concrete pavements.
- h) What are the components of Pavement Management System ? (5×8=40 Marks)





PART – B

Module – I

- II. a) Explain the Group Index method of pavement design.
- b) Plate bearing test conducted with 30 cm diameter plate on a subgrade soil sustained a load of 1500 kg at 0.25 cm deflection. The test when carried out on a base course of thickness 18 cm sustained a load of 5500 kg, at 0.25 cm deflection. Design the pavement section. Wheel load = 5500 kg, tyre pressure is 7.5 kg/cm^2 . Use Burmisters approach.

OR

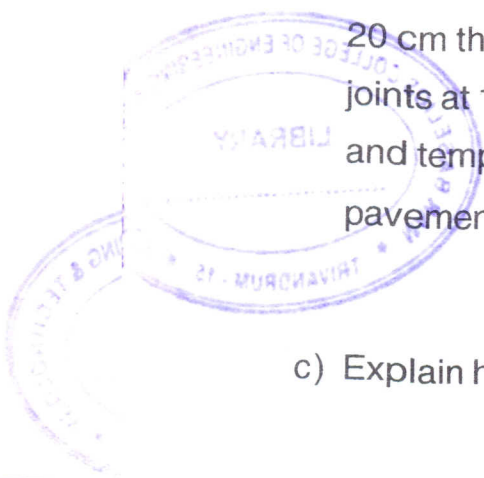
- c) Explain the overlay method of design as per IRC.
- d) The CBR value of subgrade is 5%. The traffic volume on completion of pavement is estimated to be 2500 vehicles/day in both directions. Assume VDF as 2.5. Design a flexible pavement section for a life span of 15 years. Vehicle growth is 7.5% per year.

Module – II

- III. a) Briefly outline the IRC recommendations for determining the thickness of cement concrete pavement.
- b) Determine the warping stresses at interior , edge and corner regions of a 20 cm thick cement concrete pavement for a two lane highway with transverse joints at 10 m. intervals. Assume modulus of subgrade reaction as 6.9 kg/cm^3 , and temperature differential for day and night to be $0.6 \text{ }^\circ\text{C./cm}$ thickness of pavement.

OR

- c) Explain how the dimensions and spacing of tie bars are designed.





d) Design a runway pavement section for a design gross weight of 70,000 kg. Tests were conducted on pavement materials and CBR values so obtained are as under.

Compacted subgrade soil – 4%

Ungraded gravel – 20%

Graded gravel – 35%

The runway pavement is expected to sustain 20,000 load coverage. 20

20

Module – III

IV. a) Briefly explain the construction procedure of premix carpet.

b) Explain with sketches how the subsurface drainage system is provided to lower the water table and control the seepage flow. 20

20

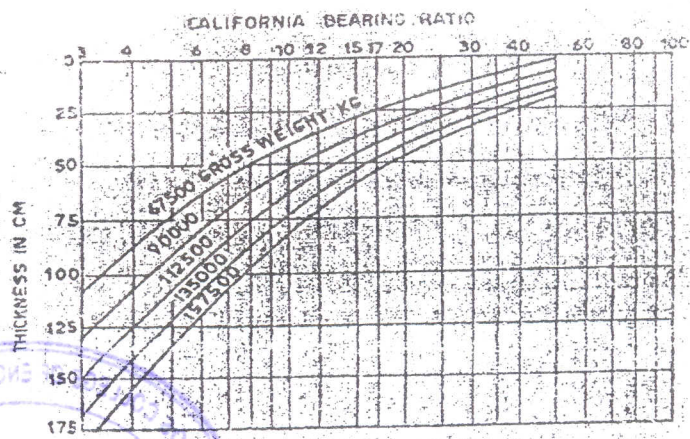
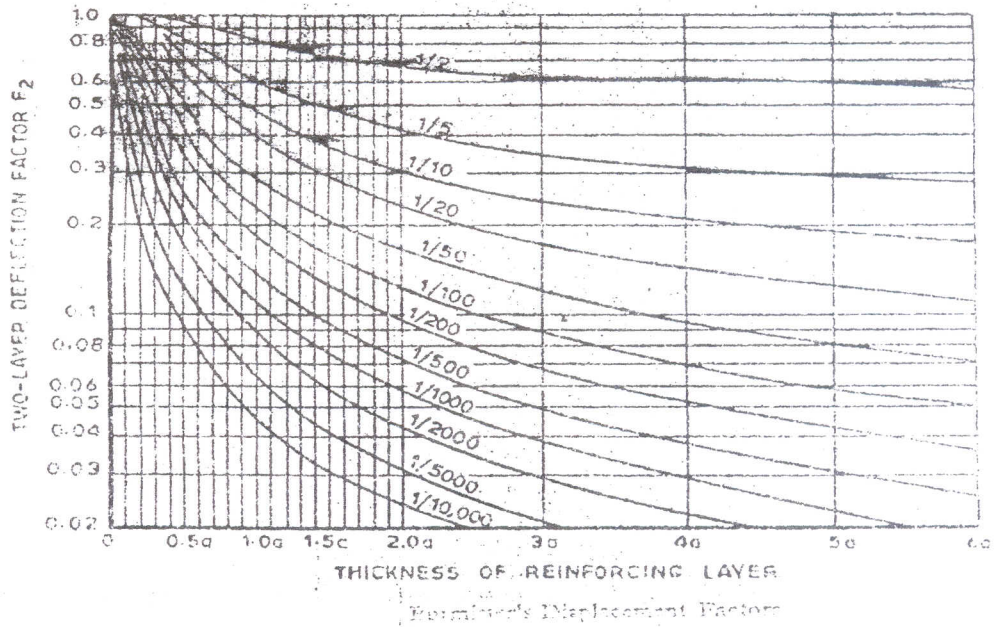
OR

c) Briefly explain the functional and structural evaluation of pavements.

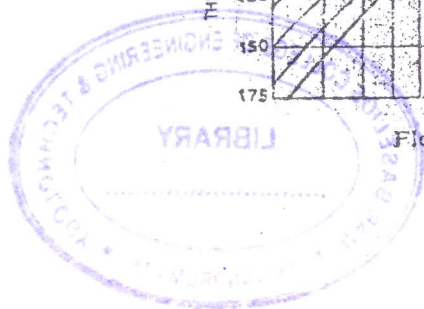
d) Write down the various steps involved in the construction of bituminous macadam road. 20

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Flexible Airport Pavement Design Curve



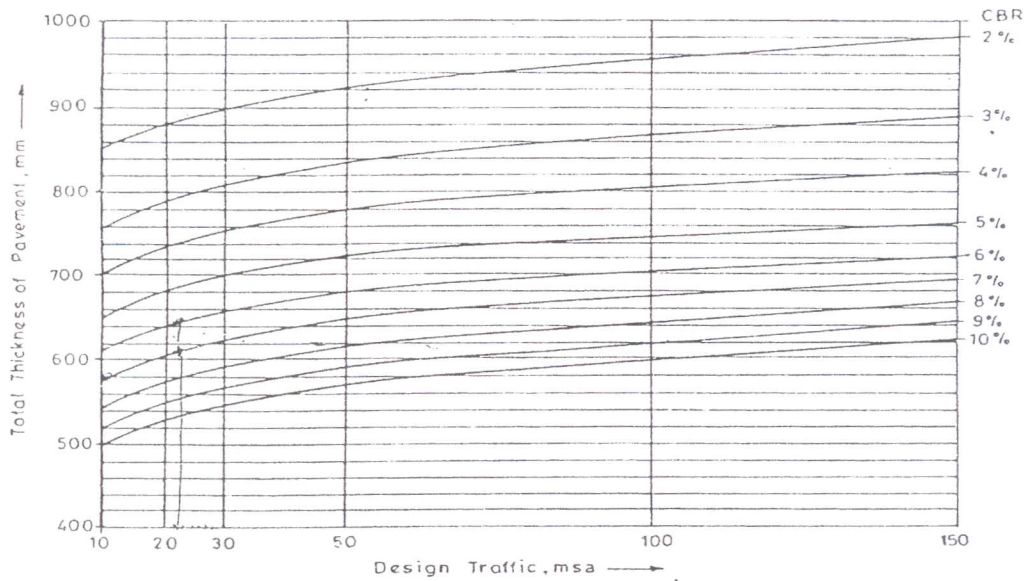


Fig. 16.15. Pavement thickness design chart for traffic 10-150 msa.
(Source : IRC : 37-2001)

PAVEMENT DESIGN CATALOGUE I (Ref. 18)
RECOMMENDED DESIGNS FOR TRAFFIC RANGE 1-10 msa

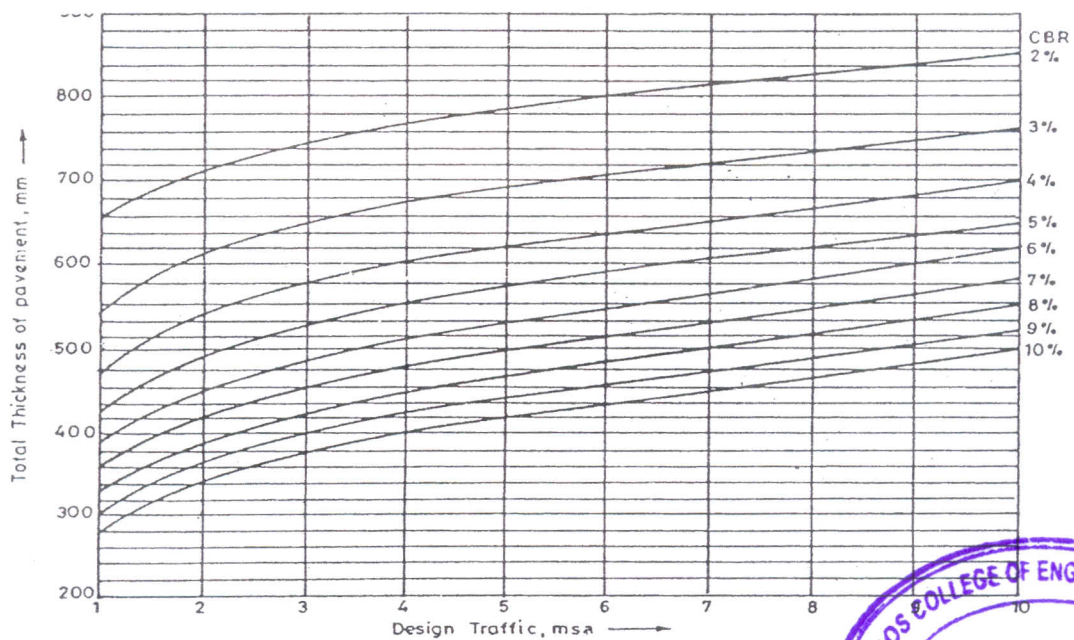


Fig. 16.14. Pavement thickness design chart for traffic 1-10 msa.
(IRC : 37-2001)

