



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, December 2013
(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 flexible, rigid and composite pavements.
- b) Enumerate factors to be considered in design of pavements.
- c) Enlist different types of overlays. Explain the concept of overlay design.
- d) Explain the terms modulus of subgrade reaction and radius of relative stiffness.
- e) Explain briefly the requirements of airport pavements.
- f) Briefly explain the temperature stress in concrete pavements.
- g) Distinguish between premia carpet and bituminous concrete.
- h) Briefly explain with sketch surface drainage system in urban roads.

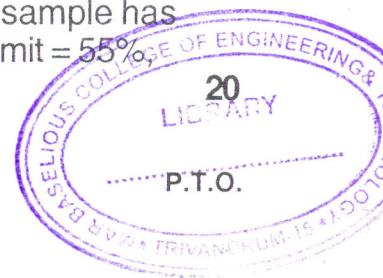
(5x8=40 Marks)

PART – B

MODULE – I

- II. a) Explain CBR method of pavement design as per IRC.
- b) Explain group index method of pavement design. A subgrade soil sample has the following properties. Soil passing 0.075 mm, sieve = 60%, liquid limit = 55%, plastic limit = 45%. Find group index.

OR





- c) Explain Burmister layer theory.
- d) Plate bearing test conducted with 30 cm diameter plate on subgrade soil yielded a pressure of 1.5 kg/cm^2 at 0.5 cm deflection. The test was again carried out on a base course layer of thickness 20 cm and yielded a pressure of 4.5 kg/cm^2 for 0.5 cm deflection. Design pavement section for wheel load of 4100 kg with tyre pressure 6 kg/cm^2 for some deflection. Use Burmister approach. **20**

MODULE – II

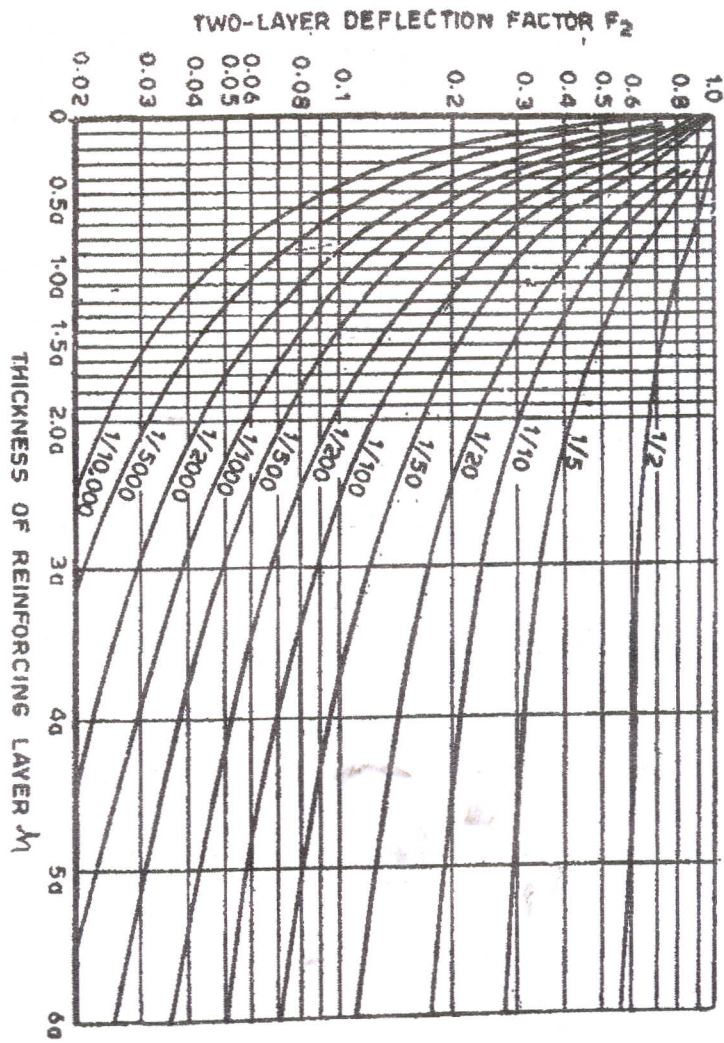
- III. a) Explain the Westergaard's concept of temperature stresses in concrete pavements.
- b) Calculate the stress at corner and edge region of a cement concrete pavement using IRC chart using the following data. Wheel load = 4100 kg, $E_c = 3 \times 10^5 \text{ kg/cm}^2$, Poissons ratio = 0.15, pavement thickness 20 cm. Modulus of subgrade reaction = 6 kg/cm^3 , Radius of contact area = 15 cm. **20**

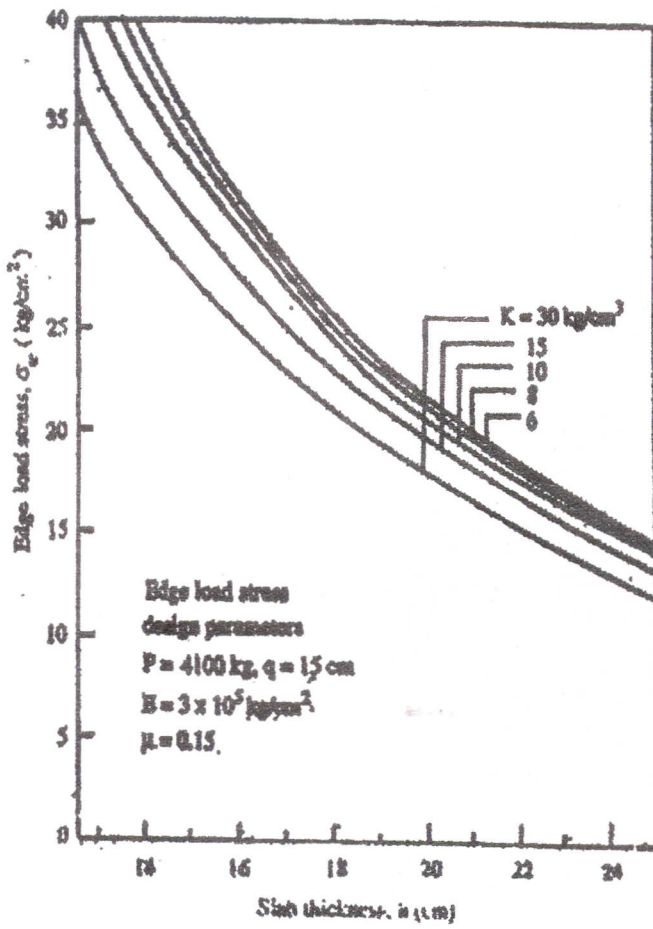
OR

- c) Explain the effect due to expansion and contraction of cement concrete slab and discuss the type of stress induced in the slab.
- d) A cement concrete pavement 20 cm thick and 7.5 m width has a longitudinal joint along the centre line. Design diameter and length of tie bars and its spacing. Allowable working stress in steel 1400 kg/cm^2 in tension bond strength of deformed bar in concrete 24.6 kg/cm^2 and coefficient of friction 1.2. Assume unit wt of concrete 2400 kg/m^3 . **20**

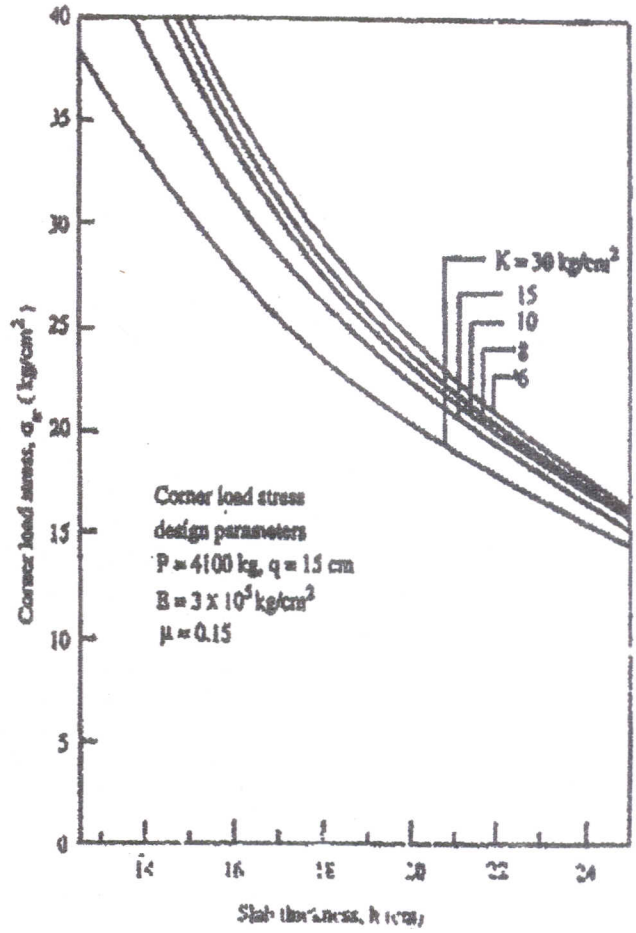
MODULE – III

- IV. a) Briefly explain construction procedure of Bituminous concrete. **20**
- b) Write brief note on cross drainage structures. **20**
- OR
- c) Briefly explain the various pavement evaluation methods.
- d) What are the components of pavement management system ? **20**





I.R.C. chart for corner load stress



I.R.C. chart for edge load stress in concrete pavements