

PAVEMENT DESIGN (Elective-II)

Time : Three Hours Maximum Marks : 100 Minimum Pass Marks : 35

Note : Attempt five questions in all selecting one question from each Unit. All questions carry equal marks. Assume suitable data if found missing.

Unit -I

1. (a) Define equivalent single wheel load. How is it calculated graphically ? 10
- (b) Discuss the various criteria of finding equivalent single wheel load. 10

Or

2. (a) What are various equivalence load factors ? Explain them through a table. 10
- (b) How is effect of repetition of load analysed ? 10

Unit-II

- (a) Explain the flexible pavement structure with the help of a neat sketch. 10
- (b) Compare stress distribution using Boussinesque's and Burmister theory, giving neat figure. 10

Or

- (a) Compare CBR method with Group Index method. 10
- (b) Explain Burmister method of flexible pavement design, step by step. 10

Unit-III

- (a) Discuss the Rate Load Test through neat figure. 10
- (b) How temperature stresses are found in rigid pavement ? 10

Or

- (a) Explain the assumptions of Westergaard's analysis. 10
 - (b) Calculate the stresses at interior, edge and corner regions of cement concrete pavement using Westergaard's analysis. Use the following data : 10
- (i) Wheel load = 4500 kg
 - (ii) E of concrete = $3 \times 10^5 \text{ kg/cm}^2$
 - (iii) Pavement thickness = 23 cm
 - (iv) Poisson's ratio of concrete = 0.15
 - (v) Modulus of subgrade reaction = 3 - 5 kg/cm^3
 - (vi) Radius of contact = 19 cm

Unit-IV

How rigid pavement design is done by IRC : 58 : 2002 using Fatigue concept ? Explain step by step in detail. 0

Or

8. (a) What is present serviceability index ? How rigid pavement is designed by Aashto method ? Explain step by step. 10
- (b) Explain the concept of reliability of cement concrete pavement giving a neat sketch. Discuss the importance of the reliability analysis. 10

Unit-V

9. (a) How rebound deflection is determined by Bankelman beam ? 10
- (b) Explain the analysis of data, obtained by Bankelman beam. 10

Or

10. (a) How is strengthening done by various types of overlays ? 10
- (b) How is rigid overlay designed ? 10