

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, JUNE 2010**

CE 04—705 (D)—PAVEMENT DESIGN

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

IRC 37-2001 and 58-2002 and design charts are permitted.

1. (a) Compare highway and airport pavements.
- (b) Briefly explain the causes and effects of moisture content and temperature in flexible pavements.
- (c) Write a note on the design details of expansion joints in C.C. pavements by IRC recommendations.
- (d) Discuss the advantage and limitations of CBR method of design.
- (e) Explain ESWL and the concept in the determination of equivalent load.
- (f) Discuss Westergaard's concept of temperature stresses in concrete pavements.
- (g) Write a short note on pavement distress in flexible pavements.
- (h) Briefly explain Benkelman Beam rebound deflection test.

(8 × 5 = 40 marks)

2. (a) (i) List and explain some of the tests which are used for measuring the soil strength for pavement design. (8 marks)
- (ii) For a given wheel load, which will be thicker, a highway or an airport pavement ? Why ? (7 marks)

Or

- (b) (i) Explain the factors affecting design and performance of pavements. (7 marks)
 - (ii) Write a note on Hveem's method of mix design of flexible pavements. (8 marks)
3. (a) (i) Explain Burmister's two layer theory. (8 marks)
 - (ii) A dual wheel load has 90 kN and tyre pressure of 1 N/mm.² on each wheel with a clear spcing between the wheels as 400 mm. Determine the ESWL for pavement thickness of 300 mm. and 500 mm. (Use graph sheet papers).

(7 marks)

Or

- (b) (i) Explain McLeod method of pavement design. (7 marks)
- (ii) Enumerate the different methods of flexible pavement design. (8 marks)

Turn over

4. (a) (i) Discuss the design details of dowel bars. (6 marks)
(ii) Design the C.C. pavement thickness for a wheel load of 5100 kg. Assume all data suitably. (9 marks)

Or

- (b) (i) Explain the design considerations for spacing of (1) Expansion joints ; (2) Contraction joints. (6 marks)
(ii) Find the spacing between contraction joints for a 3.5 m. slab width having a thickness of 22 cm. for : Plain concrete slab. The allowable stress value in concrete are 0.8 kg./m.^2 and the coefficient of friction is 1.5. (9 marks)
5. (a) (i) Write a descriptive note on pavement evaluation. (7 marks)
(ii) Explain the necessity of design approach and method of strengthening of existing pavements for : Flexible overlay over rigid pavement. (8 marks)

Or

- (b) (i) Explain the principle and uses of the Benkelman Beam test. (8 marks)
(ii) Explain plate load test in evaluating the structural behaviour of pavements. (7 marks)

[4 × 15 = 60 marks]