

CBCS SCHEME

17CV833



Eighth Semester B.E. Degree Examination, Feb./Mar. 2022 Pavement Design

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use relevant charts, code books are permitted IRC 37-2001, IRC 58-2002.*

Module-1

- 1 a. Describe the desirable characteristics of pavements. (06 Marks)
- b. Write comparison between flexible and rigid pavement. (08 Marks)
- c. Explain the three important design strategies of pavement. (06 Marks)

OR

- 2 a. State the assumption and limitation of Boussinesq's theory. (06 Marks)
- b. Write comparison between highway and air field pavement. (06 Marks)
- c. Design the thickness of flexible pavement by Burmistor two layer analysis for a wheel load 50kN and a tyre pressure of 0.5MN/m². The modulus of elasticity of a pavement materials is 150MN/m² and that at the subgrade is 30MN/m². (08 Marks)

Module-2

- 3 a. Explain the concept of ESWL. (06 Marks)
- b. What are factors affecting design of pavement? (06 Marks)
- c. Design a highway pavement using Mclead method of wheel load 6000kg with tyre pressure at 6kg/cm². The plate load test conducted on subgrade soil using 30cm diameter plate yield a pressure 2.5kg/cm² after 10 load repetitions at 0.5cm deflection. (08 Marks)

OR

- 4 a. Determine the equivalent wheel load factor of the following two axle loads in terms of the standard axle load of 8.16t.
 - i) LCV with rear axle load of 2.0t
 - ii) HCV with rear axle load of 15.5t(06 Marks)
- b. Calculate ESWL of a dual wheel assembly carrying 2044kg each for pavement thickness at 15cm, 20cm and 25cm. The center to center spacing is 27cm and the distance between walls of the tyres is 11cm. (06 Marks)
- c. Design the pavement of a two way road on a soil CBR 4% for an initial traffic of 1200 CVPD. The period of construction is 5 years and the design life is 12 years after opening to traffic. The VDF is 2.0. The rate of growth of traffic is 8% per annum. (08 Marks)

Module-3

- 5 a. Explain typical failures of flexible pavement. (10 Marks)
- b. Briefly explain the various maintenance works of bituminous surfaces. (10 Marks)

OR

- 6 Write a note on:
 - a. Roughness measurement (06 Marks)
 - b. Falling weight deflectometer (06 Marks)
 - c. Benkelman beam deflection method. (08 Marks)

Module-4

- 7 a. Explain the factors affecting design of rigid pavement. (10 Marks)
b. State the assumption of Westergard's analysis. (04 Marks)
c. Explain the concept of wheel load stress and warping stress. (06 Marks)

OR

- 8 a. Explain step by step procedure for design of dowel bars as per IRC. (10 Marks)
b. Explain the design factors at Runway pavement. (10 Marks)

Module-5

- 9 a. Explain the failures in rigid pavement. (10 Marks)
b. Explain the different methods of pavement evaluation. (10 Marks)

OR

- 10 a. List the types of joints and explain briefly. (10 Marks)
b. List and explain the desirable properties of subgrade soil. (10 Marks)

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