



CBCS SCHEME

18CV825

Eighth Semester B.E. Degree Examination, Dec.2024/Jan.2025 Pavement Design

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any may be assumed.*

Module-1

- 1 a. Explain the desirable factors to be considered for the design of pavement. (10 Marks)
- b. List any five differences of highway and airport pavement. (05 Marks)
- c. What are the assumptions of two layer Burmister's theory? (05 Marks)

OR

- 2 a. With neat sketches briefly explain the components of flexible and rigid pavement. (10 Marks)
- b. Discuss the steps involved in Burmister's two layer theory. (10 Marks)

Module-2

- 3 a. Calculate the ESWL of a dual wheel assembly carrying 2044 kg each for pavement thickness of 20 cm, 25 cm and 30 cm. Centre to centre tyre spacing is 300 mm and the distance between the walls is 120 mm. (10 Marks)
- b. List the design factors considered in the design of flexible pavement. Explain any three of them. (10 Marks)

OR

- 4 a. Briefly explain the concept of CSA method as per IRC-37-2001. (10 Marks)
- b. Calculate the thickness of bituminous surface by Kansas method. $E_s = 90 \text{ kg/cm}^2$, $E_p = 900 \text{ kg/cm}^2$, Wheel load = 5100 kg, tyre pressure, $p = 7 \text{ kg/cm}^2$, Traffic coefficient, $x = 1.25$, Saturation coefficient, $y = 0.8$. Assume $\Delta = 0.25 \text{ cm}$. Design the thickness of pavement layer, base course, subbase course are to be provided having 'E' values 400 kg/cm^2 and 200 kg/cm^2 . Assume pavement consists of single layer. (10 Marks)

Module-3

- 5 a. Explain different type of pavement failures. (10 Marks)
- b. Explain step by step procedure of conducting Benkleman beam deflection studies for evaluation of flexible pavement. (10 Marks)

OR

- 6 a. Explain the details of falling weight deflectometer. (10 Marks)
- b. Explain : i) Alligator cracking ii) Frost heaving. (10 Marks)

Module-4

- 7 a. Explain :
- i) Radius of relative stiffness
 - ii) Equivalent radius of resisting section
 - iii) Critical load position. (10 Marks)
- b. Explain the steps for design of CC pavement using IRC – 58 – 2002. (10 Marks)

OR

- 8 a. Calculate the wheel load stresses at all positions using the following data:
 $P = 5100 \text{ kg}$, $E = 3 \times 10^5 \text{ kg/cm}^2$, $b = 18 \text{ cms}$, $\mu = 0.15$, $K = 6.0 \text{ kg/cm}^3$ and $a = 15 \text{ cms}$. (10 Marks)
- b. Discuss the details of design of tie bars. (10 Marks)

Module-5

- 9 a. With neat sketches explain the types of joints in CC pavement. (10 Marks)
- b. Explain the different methods of pavement evaluation. (10 Marks)

OR

- 10 a. With the help of neat sketches explain mud pumping in cement concrete pavement. (10 Marks)
- b. Explain the various types of failures in cement concrete pavements and their causes. (10 Marks)

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