

G 1719

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Eighth Semester

Branch : Civil Engineering

CE 010 804 L05—HIGHWAY AND AIR FIELD PAVEMENTS (Elective III) [CE]

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Differentiate between flexible and rigid pavements.
2. What is group index ?
3. How are the design charts for rigid pavements developed ?
4. Explain expansion and contraction joints.
5. Why do we need pavement maintenance ?



(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Using a suitable diagram, explain the concept of equivalent single wheel load.
7. Explain McLeod method of pavement design.
8. What do you mean by equivalent radius of resisting section ?
9. Explain Bradbury's analysis for load transfer capacity of a single dowel bar.
10. Which factors contribute to roughness and skid in pavements ?

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. Explain the mechanism of load transfer in flexible and rigid pavements with the help of suitable diagrams.

Or

Turn over

12. Which are the main design factors considered in pavement design ? Describe about them.
13. The CBR value of a subgrade soil is 4 %, calculate total thickness of a pavement using :
- Design curve developed by California State Highway Department. (3 marks)
 - Design chart- recommended by IRC. (3 marks)
 - Design formula developed by the US corps of Engineers. (3 marks)
 - Using IRC design chart, when compacted sandy soil with 7 percent CBR is available. (3 marks)

Assume 4100 kg. wheel load, ADT of commercial vehicles as 1200 and tyre pressure 7 kg./cm.²

Or

14. Explain Burmister's layer theory.
15. Calculate stress at interior, edge and corner of a CC pavement by Westergaard's equation. Wheel load = 5200 kg., E of concrete 3×10^5 kg./cm.², Thickness of pavement 20 cm., Poisson's ratio of concrete 0.15, Modulus of subgrade reaction 5 kg./cm.³ Radius of contact area 15 cm.

Or

16. What are wheel load stresses ? Explain evaluation of wheel load stresses for design.
17. Design the length and spacing of the bars for a CC pavement of 18 cm. thickness, has two lanes of 7.1 m. with a joint. $W = 2400$ kg./cm.², $S_a = 1750$ kg./cm.², coefficient of friction is 15 and $S_b = 24.6$ kg./cm.²

Or

18. Design the spacing between construction and expansion joints, when expansion joint gap is 2 cm. laying temperature is 15° C., maximum slab temperature is 50° C., slab thickness 20 cm., $f = 1.5$ and PCC with $S_c = 0.8$ kg./cm.²
19. What are the common types of pavement distresses ?

Or

20. What are overlays ? Differentiate between different types of overlays. Discuss the design of overlays.

(5 × 12 = 60 marks)

