

**F 6685**

(Pages : 2)

Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, NOVEMBER 2017**

**Eighth Semester**

Branch : Civil Engineering

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

(New Scheme—2010 Admission onwards)

[Supplementary]

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 3 marks.*

1. List pavement types.
2. Define and explain CBR value.
3. Explain modulus of sub grade reaction.
4. Explain combination of stresses in concrete roads.
5. Explain skid resistance.

(5 × 3 = 15 marks)

**Part B**

*Answer all questions.*

*Each question carries 5 marks.*

6. Explain equivalent wheel load.
7. Explain the design principles of flexible foundation.
8. Discuss temperature stresses in rigid roads.
9. Explain application of design charts for design of concrete roads.
10. Write short note on pavement evaluation.

(5 × 5 = 25 marks)

**Turn over**

**Part C**

*Answer all questions.  
Each full question carries 12 marks.*

11. Explain the structural behaviour of flexible roads. State the site conditions suitable for flexible road. Discuss the impact of climate on flexible roads.

*Or*

12. Explain, repetition of loads, elastic moduli and design factors in connection with design of flexible and rigid roads. State the basic difference between flexible and rigid roads.
13. Explain Burmister's layer theory for design of flexible foundation.

*Or*

14. Design a flexible high way pavement for a wheel load of 41 kN with tyre pressure of 50 N / Sqcm. by McLead method. The plate bearing test carried out on sub grade soil using 300 mm. diameter plate yield a pressure of 25 N/sqcm. after ten repetition of loads at 5 mm. deflection.
15. Explain radius of stiffness, critical load position and Bradly's stress coefficient with reference to rigid roads.

*Or*

16. Determine the stresses at interior, edge and corner regions of a cement concrete pavement using Westergaard's stress equation for the following data :
- Wheel load = 51 kN,  $E = 3 \times 10^6$  N/sqcm., pavement thickness = 200 mm., poisson's ratio for concrete = 0.15, modulus of sub grade reaction  $K = 60$  N/sqcm. and radius of contact area = 150 mm.
17. Discuss the design procedure for design of dowel bars and tie bars for concrete roads. State IRC recommendations for design of concrete dams.

*Or*

18. A cement concrete pavement 240 mm. thick and 8 M width has a longitudinal joint along the centre line. Design the diameter, length and spacing of the tie bars, if the allowable working stress in Steel is 14 kN/sqcm in tension, allowable bond strength of deformed bars in concrete is 2.46 kN/sqcm. and coefficient of friction is 1.2. Assume unit weight of concrete as 24 kN/cum.
19. Explain environmental influence and effect on concrete roads.

*Or*

20. Explain with neat sketches the various types of pavement distresses in cement concrete pavement and their causes and remedial measures.

(5 × 12 = 60 marks)