



**B.E. DEGREE EXAMINATIONS: NOV 2015**

(Regulation 2009)

Seventh Semester

**CIVIL ENGINEERING**

CEE207: Pavement Engineering

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. This pavement is also known by the name “low modulus pavement”. What is it?
  - a) Flexible pavement
  - b) Semi flexible
  - c) Rigid pavement
  - d) Composite- flexible
2. Contact pressure is \_\_\_\_\_ to inflation pressure.
  - a) Inversely proportional
  - b) Directly proportional
  - c) Greater than
  - d) Lower than
3. When the design of flexible pavement is based on stress-strain functions it is called
  - a) Empirical methods
  - b) Semi empirical
  - c) Theoretical
  - d) Group index method
4. Design of flexible pavement based on concept of cumulative standard axle load refers from
  - a) IS 875 - 2007
  - b) IS 456 - 2000
  - c) IRC-37-2001
  - d) IRC-58-2002
5. The load transfer device used at expansion joints are called
  - a) Compactors
  - b) Vibrators
  - c) Dowels
  - d) Batching

6. As per IRC guidelines the design life for National Highway is
- a) 15 years
  - b) 10 years
  - c) 20 years
  - d) 25 years
7. For good riding quality the required unevenness for old pavement is
- a) 95 to 119 cm/km
  - b) 120 to 144 cm/km
  - c) Below 120 cm/km
  - d) Above 145 cm/km
8. Mud jacking is the latest method adopted worldwide to repair the
- a) Strengthening of pavement
  - b) Filling up of pot holes
  - c) Cracked and broken slabs
  - d) Proving shoulders
9. Bitumen-sand stabilization is the only alternate for
- a) Black cotton soil
  - b) Sand ridden area
  - c) Weak soil
  - d) Clay soil
10. The CBR value for weak soil is
- a) Greater than 5%
  - b) Less than 5%
  - c) Greater than 3%
  - d) Less than 3%

**PART B (10 x 2 = 20 Marks)**

11. What are the types of flexible pavements?
12. Define rigidity factor
13. What is the use of CBR value in pavement design?
14. State the factors connected with stability of pavements
15. What are the stresses acting on the Cement concrete pavement slabs?
16. State the importance of providing joints in road pavement
17. List the general causes for pavement failures.
18. Define serviceability index
19. What is soil stabilization?
20. State the effect of moisture in pavements.

**PART C (5 x 14 = 70 Marks)**

21. a) (i) Distinguish between flexible and rigid pavements (8)  
(ii) State the conditions imposed by IRC on vehicle loads (6)

**(OR)**

- b) (i) Explain the repetition of wheel loads and equivalent wheel load factors (8)  
(ii) Describe the concept in the determination of Equivalent single wheel load (6)

22. a) Explain in detail the CBR method of design of flexible pavements.

**(OR)**

- b) Plate bearing test was conducted with the 30cm dia plate on a subgrade that yielded a pressure of  $2.4\text{kg/cm}^2$  at 0.28cm deflection. The test carried out on a base plate thickness of 20cm yielded a pressure of  $10\text{kg/cm}^2$  at 0.26cm deflection. Design the pavement section for a wheel load of 3900kg with the tyre pressure of  $6.2\text{kg/cm}^2$  using Burmister's approach.

23. a) (i) Explain the mechanism involved in the rigid pavement. (8)  
(ii) Calculate the equivalent radius of resisting section of 20cm slab and the radius of wheel contact area is 15cm. (6)

**(OR)**

- b) Calculate the stresses at interior edge and corner regions of a cement concrete pavement using westergaard's stress equation. Take wheel load as 4800kg, Poisson's ration of concrete as 0.15, Modulus of subgrade ratio as  $6.8\text{kg/cm}^3$  and radius of contact area as 15cm, modulus of elasticity of cement concrete as  $3.1 \times 10^5\text{kg/cm}^2$ . Pavement thickness as 20cm.

24. a) (i) Describe the typical failures occurring in the flexible pavements. (8)  
(ii) Explain special repairs carried out in flexible pavements. (6)

**(OR)**

- b) (i) Write in detail about skid resistance of pavement. (8)  
(ii) Give an account of maintenance of concrete roads. (6)

25. a) (i) Give a detailed account of types of highway pavements and their stabilization. (8)

(ii) What is “Geosynthetics” and what are the functions of geosynthetics? (6)

**(OR)**

b) Give an account of stabilization of black cotton soils.

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