Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2012

Seventh Semester

CIVIL ENGINEEING

CEE207**:** Pavement Engineering

(IRC 37, IRC 58 and Pavement chart are permitted)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In Water Bound Macadam roads, binding material is
   a) Sand b) Stone dust
   c) Cement d) Brick dust
2. The pavement width of the road depends upon
   a) Terrain b) Type of traffic
   c) Number of lanes d) All the above
3. Design of flexible pavement needs to consider
   a) Wheel loads b) Intensity of traffic
   c) Climate of the region d) Subgrade condition
4. Minimum thickness of base of flexible pavement, is
   a) 10 cm b) 15 cm
   c) 20 cm d) 25 cm
5. To prevent compressive stresses in a rigid concrete pavement, the joint provided is
   a) Expansion joint b) Contraction joint
   c) Hinged joint d) All the above
6. Cement grouted pavement is classified as
   a) Rigid pavement b) Semi rigid pavement
   c) Flexible pavement d) None of these
7. Concrete pavement is provided if daily traffic per lane exceeds
   a) 500 tones b) 750 tones
   c) 1000 tones d) 1250 tones
8. Newly constructed pavement with ordinary Portland cement attains its working strength after
   a) 7 days b) 14 days
   c) 21 days d) 28 days

9. Stabilization of soil improves _____ property of the soil

a) Compaction b) Settlement

c) Durability d) Bearing capacity

10. Which of these factors is affecting the strength of the soil cement mixes?

a) Cement content b) mixing

c) Moisture Content d) All the above

PART B (10 x 2 = 20 Marks)

11. Explain the functions of Pavements.
12. Give a sketch showing the various layers in pavements practiced in India.
13. What are the drawbacks in the simple Boussinesq's approach?
14. Write the objectives of AASHO road test.
15. What are the factors affecting the design of rigid pavements.
16. Explain about joints in concrete pavements.
17. Write the importance of skid resistance of surfaces.
18. What are the typical ways of deterioration in Water Bound Macadam surface?
19. What are the various field control tests for stabilization?
20. Give the factors affecting the choice of stabilization technique.

PART C (5 x 14 = 70 Marks)

21. a) Compare the rigid and flexible pavement systems.

(OR)

b) Explain briefly about stress and deflection in pavement under repeated loading.

22. a) (i) Calculate the deflection at the surface of a pavement due to a wheel load of 40 kN and a tyre pressure of 0.5 MN/m^2. The value of E of the pavement and subgrade may be assumed to be uniformly equal to 20 MN/m^2. (7)

(ii) Explain Burmister two layer theory for design of pavements (7)

(OR)

b) Explain about the IRC guidelines of flexible pavement.

23. a) Design a tie – bar system for a cement concrete pavement, given:

1. Slab thickness, h = 20 mm.
2. Slab width, b = 3.35 mm.

3. Number of lanes to be tied = 2.
4. Coefficient of friction between slab and subgrade = 1.5.
5. Weight of slab = 480 kg/m^2.
6. Allowable working stress in steel = 1400 kg/cm^2.
7. Maximum permissible bond stress:
   i. Plain bars: 17.5 kg/cm^2
   ii. Deformed bars: 24 kg/cm^2.

(OR)

b) What are the various types of joints? Explain with neat sketches.

24. a) What are the methods of pavement evaluation and explain in detail about Benkelman Beam Deflection Method with neat sketch.

(OR)

b) Write in detail about the following
   i. The maintenance of cement concrete roads
   ii. The maintenance of gravel roads.

25. a) Explain about the uses of geosynthetics in pavement design

(OR)

b) What are the different soil stabilization techniques? Explain any one of the techniques in detail.

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