

Reg. No. _____

Karunya University

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – May / June 2009

Subject Title: **REINFORCED CONCRETE STRUCTURES - II**

Time : 3 hours

Subject Code: **CE250**

Maximum Marks: 100

Use of IS: 3370, IS: 456 and IS:1893 codes may be permitted

Answer ALL questions

PART – A (10 x 1 = 10 MARKS)

1. In public buildings, where large spaces are available, _____ type of staircase is generally preferred.
2. When is shear key recommended for a retaining wall?
3. The minimum grade of concrete exposed to water should be _____.
4. The hoop tension is maximum at _____, in the case of tanks with sliding or freebase.
5. The maximum size of reinforcement for bridges shall be _____.
6. When is T-beam bridge adopted?
7. What is a braced frame?
8. List any two assumptions made in portal method of analysis.
9. Draw the typical yield line pattern for a circular slab simply supported.
10. In the strip method, of analysis for slabs, the _____ in the slab are neglected.

PART – B (5 x 3 = 15 MARKS)

11. What are the types of staircases? Give the typical dimensions of tread and riser.
12. List the type of joints between tank walls and floor slabs.
13. Briefly explain the following: (i) Impact effect, (ii) Impact factor.
14. Define Ductility. What are the factors influencing ductility?
15. Write any three properties of yield lines.

PART – C (5 x 15 = 75 MARKS)

16. The details of a doglegged staircase of a multi-storied building are given below:

Number of steps in the flight = 10

Tread, T = 300 mm, Rise, R = 150 mm

Width of landing slab on either side = 1.2m

Use M-20 grade concrete and Fe-415 HYSD bars.

Design and detail any one of the flights of the staircase.

(OR)

17. Design and detail a T-shaped retaining wall to retain earth embankment of 3m high above ground level. The unit weight of earth is 18 kN/m^3 and its angle of repose is 30° . The embankment is horizontal at its top. The safe bearing capacity of the soil may be taken as 100 kN/m^2 and the coefficient of friction between the soil and concrete is 0.5. Use M-20 grade concrete and Fe-415 bars.

[P.T.O]

18. A rectangular water tank 4.5 m long, 2.25 m wide and 2.25 m high has its walls rigidly jointed at the vertical edges and pin jointed at their horizontal edges. Design the tank if it is supported on all sides under the wall. Use M-20 grade concrete and mild steel reinforcement bars. Sketch the details of reinforcement neatly.

(OR)

19. Design a circular tank with flexible base for a capacity of 400000 litres. The depth of the water is to be 4m. Free board = 200 mm. Use M-20 grade concrete and Fe-415 HYSD bars. The permissible stresses should comply with the values recommended in IS: 3370 and IS: 456-2000 codes. Sketch the details of reinforcements

20. What is Courbon's method? Explain the method with neat sketch and its applications in detail.

(OR)

21. Design a solid slab bridge for class A loading for the following data:

Clear span : 5 m
 Clear width of roadways : 7 m
 Average thickness of wearing coat : 80 mm
 Unit weight of concrete : 24000 N/m³
 Grade of concrete : M20

22. Explain in detail the various Codal provisions for earthquake effects as per IS: 1893- 2002.

(OR)

23. Analyse the building frame shown in fig. 1 subjected to horizontal forces by Portal method.

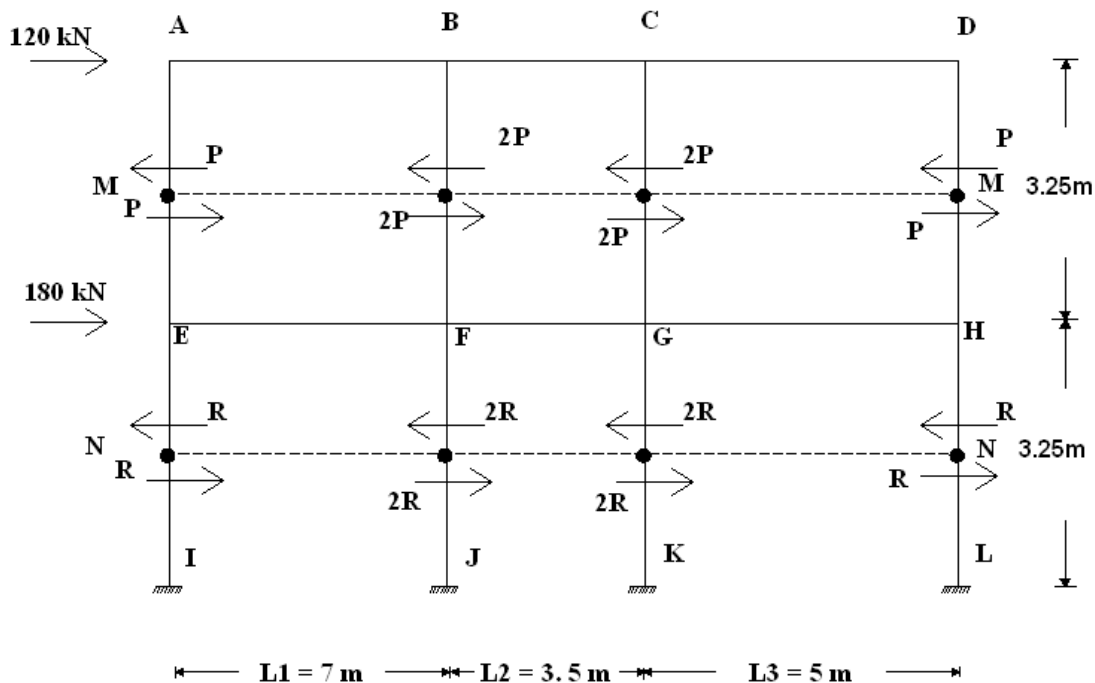


FIG. 1

24. Design a simply supported square slab of 5 m side length to support a service load of 4 kN/m². Adopt M20 grade concrete and Fe 415 grade steel bars. Assume load factors according to the IS: 456-2000 code.

(OR)

25. An orthotropically reinforced rectangular slab is simply supported along its edges and subjected to a udl of w/unit area. Analyse the slab by virtual work method.