

Reg. No. _____

Karunya University

(Karunya Institute of Technology and Sciences)

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

End Semester Examination – April/May 2011

Subject Title: REINFORCED CONCRETE STRUCTURES - II

Time: 3 hours

Subject Code: CE250

Maximum Marks: 100

Answer ALL questions

Use of IS: 456 and IRC Bridge codes may be permitted

PART – A (10 x 1 = 10 MARKS)

1. Define Staircase.
2. _____ is the length of staircase between two landings.
3. What are the types of water tank based on resting?
4. What are the methods available for analyzing rectangular water tanks?
5. Write the different types of reinforced concrete bridges.
6. What are the different types of loading based on IRC?
7. Define Substitute Frames.
8. What are the methods used for analysis of building frames subjected to lateral forces?
9. Draw the Yield line for a square slab simply supported on four sides.
10. What are the methods available for determining ultimate load capacity of RC slabs?

PART – B (5 x 3 = 15 MARKS)

11. Mention the classification of stairs.
12. What is the concept of INTZ types of water tank?
13. Discuss the impact effect.
14. Briefly explain Earth quake effects.
15. Mention the characteristics of Yield lines.

PART – C (5 x 15 = 75 MARKS)

16. Design a dog- legged stair for a building in which the vertical distance between floors is 3.6m. The stair hall measures 2.5m X 5m. The live load may be taken as 2500 N/m². Use M20 concrete and HYSD bars.
(OR)
17. Design a T shaped cantilever retaining wall to retain earth embankment 3m high above ground level. The unit weight of earth is 18kN/m³ and its angle of repose is 30°. The embankment is horizontal at its top. The safe bearing capacity of soil may be taken as 100kN/m² and the coefficient of friction between soil and concrete as 0.5. Use M20 mix and Fe415 bars.
18. An underground water tank 4mX10mX3m deep. The subsoil consists of sand having angle of repose of 30° and saturated unit weight of 17 kN/m³. The water table is likely to rise up to ground level. Design long wall for tank empty and full condition. Taking the unit weight of water as 9.81 kN/m³.

(OR)

[P.T.O]

19. Design a circular underground tank with a domical top with the following data.

- Inside dia of tank = 10 m
- Depth of tank = 3 m
- Unit weight of subsoil = 17200 N/m³
- Angle of internal friction = 30°
- Depth of subsoil water = 8m below GL
- Use M20 concrete and Fe 415 steel.

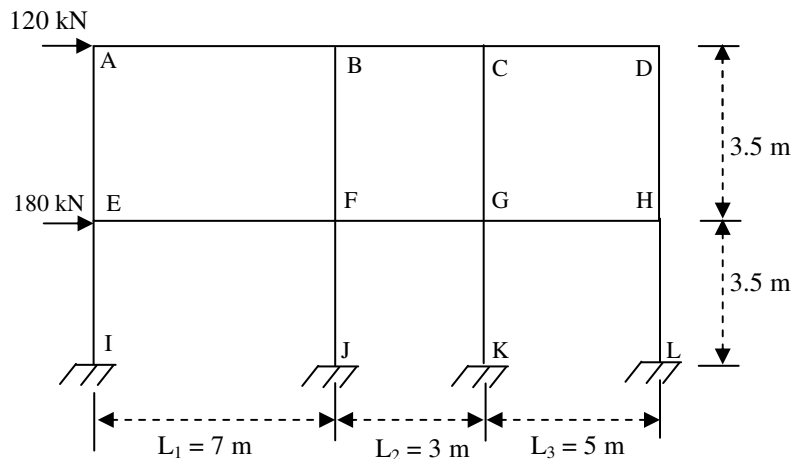
20. a. Explain the procedure of Courbon's method in distributing the live load in longitudinal girders.
b. Explain the types of loading considered in the design of bridges.

(OR)

21. Design a reinforced concrete slab culverts for a National highway crossing to suit the following data.

- Carriage way = Two lane (7.5 m wide)
- Foot paths = 1m on either side
- Clear span = 6m
- Wearing coat = 80mm
- Width of bearing = 400mm
- Use M25 grade concrete and Fe415 grade HYSD bars.
- Loading – IRC class AA tracked vehicle.

22. Analyze the building frame, subjected to horizontal force in Figure. Use portal method.



(OR)

23. How will you analyze an intermediate frame of a multi storied building by substitute frame method? Explain the step by step procedure.

24. Explain in detail the yield line portion of a slab and moment capacity along an yield line.

(OR)

25. A square slab of side length 4m is simply supported at the ends and carries a service live load of 3 kN/m². Design the slab. Use M20 concrete and Fe415 steel bars.