

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 – November/December 2010

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

Time: 3 hours

Subject Code: **CE250**

Maximum Marks: 100

(Use of 16456-2000, IRC codes, IS 3370, IS 1893-2002 and Design Aids (SP 16) permitted)

(Use M20 concrete and Fe415 steel unless otherwise specified)

Answer ALL questions

PART – A (10 x 1 = 10 MARKS)

1. The additional dead or live loads on earth embankments behind retaining wall is called _____.
2. How is riser and tread proportioned in a stairway?
3. When is the wall of an RC water tank provided with two layers of reinforcements?
4. For a rectangular RC water tank with walls subjected to bending moment and tension, the l/b ratio of walls is _____.
5. Where is IRC class B loading used?
6. List the methods of finding the distribution of loading in bridges.
7. What is a substitute frame?
8. List the method of analysis of building frames subjected to lateral forces.
9. Write the generalized expression for finding the moment capacity if rectangular slab by yield line theory.
10. What is an orthotropic slab?

PART – B (5 x 3 = 15 MARKS)

11. With suitable diagram, specify how you can find the earth pressure on a sloping backfill.
12. In what ways, circular water tank is preferred over rectangular water tanks?
13. Specify the conditions under which, Courbon's method is applicable for design of bridges.
14. In what ways, the analysis of continuous beam differs from that of building frames?
15. What are the characteristic features of yield line?

PART – C (5 x 15 = 75 MARKS)

16. Design a dog legged stair for an office building in a room measuring 2.8m x 5.8m clear. Floor to floor height is 3.6 m; width of flight is 1.25m; Live load = 3kN/m^2 ; use M20 and fe 415.
(OR)
17. Suggest suitable dimensions and draw the pressure distribution diagram for a counterfort retaining wall of height 6m above GL. Also design the stem portion. The soil is having SBC 160kN/m^2 with internal friction angle 30° ; Density of soil is 16kN/m^3 . Spacing of counterfort is 3m c/c.
18. Design the side walls of rectangular RCC water tank of plan size 6m x 2m having maximum depth of 2.5m.
(OR)
19. Design an RCC circular water tank resting on ground with flexible base for storing 5 lakh liter of water; Depth of storage is 4m; free board is 200mm.

[P.T.O]

20. Design a RCC tee beam glider bridge for a roadway of 7.5m, span 16m subjected to IRC class AA tracked vehicle using M25 and Fe 415.

(OR)

21. The slab panel of an RCC T beam and slab deck is 2.5 m wide between main beam and 4m long between cross gliders. Design the RCC slab for IRC class A loading, using M20 and Fe 415.

22. Analyse a two storey frame of floor height 3.5m each with 3 bays of length $L_1 = 7\text{m}$; $L_2 = 3.5\text{m}$ and $L_3 = 5\text{m}$. The frame is subjected to lateral load of 120 kN at top storey and 180 kN at bottom storey.

(OR)

23. Portal frames were provided for hall 10m x 20m, spaced at 4m c/c. The portal frames were subjected to a total load of 125200 N and bending moment of 44.8 kNm. Design suitable foundations for the portal frame assuming suitable data.

24. A reinforced concrete slab 5m x 5m is simply supported along four edges and is reinforced with 10mm diameter Fe415 grade bars at 150mm c/c bothways. The average effective depth of slab is 100mm and overall depth is 130mm. The slab carries a flooring of 50mm thick having a unit weight of 22kN/m^2 . Determine the maximum permissible live load on the slab.

(OR)

25. Calculate the collapse load for an orthotropically reinforced circular slab, fixed around.