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Question Paper Code: 57101

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Seventh Semester

Civil Engineering

15UCE701 -DESIGN OF REINFORCED CONCRETE AND BRICK
MASONRY STRUCTURES

(Regulation 2015)

(Is 456:2000, Is 1905, Is 3370 : Part-II and SP16 are permitted)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The factor of safety due to sliding of retaining wall is generally taken as CO1- R
(a) 1 (b) 1.5 (c) 2 (d) 4
2. The minimum grade of concrete to be used in R.C water tank as per IS 456-2000 CO2- R
(a) M20 (b) M25 (c) M30 (d) M35
3. The drops are provided in flat slabs to resist CO3- R
(a) Torsion (b) Bending moment (c) Thrust (d) Shear
4. Which of the following is/are the method of analysis of yield line theory CO4- R
(a) Equilibrium method (b) Virtual work method
(c) Both (d) None of the above
5. Usually the thickness of partition wall is CO5- R
(a) 200mm (b) 300mm (c) 100mm (d) 50mm

PART – B (5 x 3= 15 Marks)

6. Write the classifications and their suitability of retaining walls. CO1- R
7. Name the different types of joints between water tank wall and floors CO2- R
8. Write the components of flat slab CO3 -R

9. What is meant by yield lines? CO4 -R
10. Compare brick wall with stone wall. CO5- R

PART – C (5 x 16= 80Marks)

11. (a) Design a cantilever retaining wall to retain earth embankment 4m height above ground level. The density of earth is 18kN/m^3 and its angle of repose is 30 degrees. The embankment is horizontal at its top. The safe bearing capacity of the soil may be taken as 200kN/m^2 and the coefficient of friction between soil and concrete is 0.5. Adopt M20 grade concrete and Fe415 HYSD bars. CO1- App (16)

Or

- (b) A R.C.C. retaining wall with counter forts is required to support earth to a height of 7 m above the ground level. The top surface of the backfill is horizontal. The trial pit taken at the site indicates that soil of bearing capacity 220 kN/m^2 is available at a depth of 1.25 m below the ground level. The weight of earth is 18 kN/m^3 and angle of repose is 30° . The coefficient of friction between concrete and soil is 0.58. Use concrete M 20 and steel grade Fe 415. Design the toe slab and do the usual stability check. CO1 -App (16)
12. (a) Design a circular water tank of capacity 400 kilolitres resting on the ground and having a fixed base condition due to rigid joint between the wall and the base slab. The materials to be used are M 25 grade concrete and HYSD steel grade Fe 415. Use IS method. CO2- App (16)

Or

- (b) Design a rectangular RC water tank (resting on the ground) with an open top for a capacity of 80000 litres. The inside dimensions of tank may be taken as $6\text{m} \times 4\text{m}$. Design the side walls of the tank using M20 concrete and Fe250 grade I mild steel. Draw the following views: CO2 -App (16)
- (i) Cross-sectional elevation of the tank showing reinforcement details in tank walls.
 - (ii) Plan of the tank showing reinforcement details

13. (a) Design a interior panel of a flat slab for a ware house of 24 m x 24 m divided into panels of 6 m x 6 m. Loading class is 5 kN/m². Materials used are M15 and Fe250 grade Imild steel. Sketch the reinforcement in an interior panel of the flat slab
- Or
- (b) Explain the step by step procedure of designing a reinforced concrete wall. CO3- App (16)
14. (a) Design using the yield - line theory a simply supported squarer slab of size 5 m to support a service imposed load of 3 kN/m². Adopt M20 concrete and Fe 415 grade reinforcement. CO4- App (16)
- Or
- (b) Design a rectangular slab 6m x 4m in size simply supported on all edges to support a service imposed load of 4kN/m². Use M20 and Fe415. CO4- App (16)
15. (a) Explain the factors to be considered in design of brick masonry CO5- App (16)
- Or
- (b) Brief the step to step procedure the design of brick wall CO5- App (16)

