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Question Paper Code: 1036179

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV / DEC 2024
Sixth Semester
Civil Engineering
U20CE602 – DESIGN OF REINFORCED CONCRETE & BRICK MASONRY STRUCTURES
(Regulation 2020)

Time: Three Hours   Maximum: 100 Marks

Answer ALL questions

PART – A   (10 x 2 = 20 Marks)

1. Define the term active earth pressure.

2. Give the criteria for the design of gravity retaining wall.

3. Mention the factors that must be considered while designing the RCC tank.

4. Point out the types of joints in water tank.

5. List out all the assumptions made in equivalent frame method.

6. Give the names of various types of bridges.

7. Illustrate the maximum shear force diagram.

8. Define similitude.

9. Define the term reinforced brick work.

10. Define the cross sectional area of a Masonry unit.

PART – B   (5 x 16 = 80 Marks)

11. (a) Design a Stem of RCC cantilever retaining wall having a 5m tall stem. The wall retains soil level with its top. The soil weighs 18000 N/m^3 and has an angle of repose of 30°. The safe bearing capacity of the soil is 200 kN/m^2. Use M20 concrete and Fe415 steel.   (16)

(OR)

(b) Design a counterfort type retaining wall to suit the following data: (16)
Height of wall above ground level=6 m
S.B.C. of soil at site=160 kN/m²
Angle of internal friction=33 degrees
Density of soils=16 kN/m³
Spacings of counterforts=3 m c/c
Materials=M20 grade concrete Fe415 HYSD bars
Sketch the details of reinforcements in details in the wall.

12. (a) Design staging for a circular water tank to a capacity of 2,00,00 litres. The tank is a height of 20 m above ground level. Use M30 concrete and Fe415 steel. (16)

(OR)

(b) A reinforced concrete water tank is 6m x 3m with a maximum depth of 2.5 m. A 150 mm x 150 mm splays are provided at the junction of walls and base slab. The tank is supported on brick masonry walls all round. Design the long wall of the tank. (16)

13. (a) Design the interior panel of a flat slab 5.6 m x 6.6 m in size, for a super imposed load of 7.75 kN/m². Provide a two-way reinforcement. Use M20 concrete and Fe 415 steel. (16)

(OR)

(b) Design a solid slab bridge for class A loading for the following data. (16)
Clear span = 4.5 m.
Clear width of road ways = 7 m
Average thickness of wearing coat = 80 mm
Use M20 mix.
Take unit weight of concrete as 24000 N/m³

14. (a) Design a rectangular slab of size 4 m x 6 m simply supported along all its edges, subjected to a live load of 4 kN/m². The coefficient of orthotropy is 0.7. Use M 20 and Fe 415. (16)

(OR)

(b) Design an equilateral triangular slab of side 5 m, isotropically reinforced and is simply supported along its edges. The slab is subjected to a superimposed load of 3 kN/m². Use M 20 concrete and Fe 415 steel. (16)

15. (a) Derive from principles the ultimate design moments for a rectangular simply supported slab panel using yield line approach. (16)

(OR)

(b) Document the design procedure to design axially and eccentrically loaded brick walls. (16)

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