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09ENG5.5

Fifth Semester B. Arch. Degree Examination, Dec.2017/Jan.2018
Structures – V

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE questions.*
2. Use of IS : 456 – 2000 permitted.

1 Explain the following :
a. Concrete mix design
b. Water–cement ratio
c. Durability of concrete
d. Reinforced concrete. **(20 Marks)**

2 a. Explain the basic principle of working stress method of design of RC structures. **(06 Marks)**
b. A rectangular RC beam 400 × 600mm is reinforced with 4 bars of 22mm dia, with a cover of 200mm. If M20 concrete and Fe415 steel are used, calculate the moment of resistance of the beam. Adopt working stress method. **(14 Marks)**

3 a. A rectangular RC beam 230 × 450mm is reinforced with 3bars of 16mm dia on tension with an effective cover of 40mm. If M20 concrete and Fe250 steel are used, calculate the moment of resistance of the beam. Adopt limit state method. **(10 Marks)**
b. A T –Beam of depth 500mm and width of rib 300mm, has flange 900 × 110mm. Calculate the moment of resistance of the beam if 5 bars of 25mm dia Fe415steel and M20 concrete are used. Effective cover to reinforcement is 60mm. Adopt limit state method. **(10 Marks)**

4 a. Differentiate between 'ONEWAY" and 'TWO WAY" slabs. **(04 Marks)**
b. Design a RC slab for a hall 4m × 16m supported on masonry wall 230mm thick. I.L = 2.5 kN/m^2. Floor finish is 1kN/m^2. M20 concrete and Fe415 steel adopt limit state method. **(16 Marks)**

5 Design the necessary reinforcement for a RC beam 300 × 450mm to carry a udl of 25kN/m over a span of 4m. The beam is supported on a 400mm thick wall at the ends. Use M20 concrete and Fe415 steel. Adopt limit state method. Assume f′= 40mm. **(20 Marks)**

6 Design the necessary reinforcement for a RC column 300mm × 400mm subjected to an axial design load of 1600 kN. Use M20 concrete and Fe415steel. Adopt limit state method sketch the c/s. **(20 Marks)**

7 Design the necessary footing for a RC column 400mm × 400mm to carry an axial load of 1100 kN. Allowable soil measure is 220 kN/m^2. M20 concrete, Fe415steel. Adopt limit state method. **(20 Marks)**

8 Design an intermediate flight of a dog legged stair case for a residential building. The vertical distance to be covered by each flight is 1500mm. R = 150mm, T = 250mm supporting wall 230mm, landing 1000mm I.L 3kN/m^2, Finishes 1 kN/m2. M20, Fe415steel, adopt limit state method. **(20 Marks)**

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