UITians

EKS-333

B.E. V Semester (CGPA) Civil Engg. Examination 2017

STRUCTURAL DESIGN AND DRAWING – I (R.C.C.)

Paper : CE-503

Time Allowed : Three Hours

Maximum Marks : 60

Note: i) Use of IS 456 2000 is permitted.

ii) Assume grade of concrete M-20 and grade of steel Fe-415 unless if not specified.

iii) Assume data suitably if any missing.

Q.1. Determine the area of tensile reinforcement required in a flanged beam having the following section dimensions to support a factored moment of 300kN.m.   12

i) Width of flange (bf) = 750mm

ii) Width of rig (bw) = 300mm

iii) Thickness of flange (Df) = 120mm

iv) Effective depth (d) = 600mm

OR

Q.2. Find the moment of resistance of a beam 250mm × 500mm deep (effective) if it is reinforced with 2-12mm diameter bars in the compression zone and 4-20mm diameter bars in the tension zone, each at an effective cover of 40mm.   12

Q.3. A rectangular reinforced concrete beam, is simply supported on two masonry walls 230mm thick and 6m apart c/c. The beam has to carry, in addition to its self weight, a distributed live load of 10kN/m and a dead load of 5kN/m. Design the beam section for maximum moment at midspan. Assume Fe-415 steel and M-20 grade concrete.　　　12

OR

Q.4. Design 300 × 850mm rectangular beam supported on two walls 750mm thick spaced at a clear distance of 6 meters. The beam carries a super imposed load of 30kN/m take M-20 grade of concrete and Fe-415 grade of steel.　　　12

Q.5. Design a one way slab simply supported on a clear span of 4m the width of the supports being 300mm. The live load on the slab is 2kN/m^2. Use M-20 concrete and Fe-415 steel.　　　12

OR

Q.6. Design a reinforced concrete slab 6.3 × 4.5m simply supported on all the four edges. If has to carry a characteristic live load of 10kN/m^2. In addition to its dead weight, Assume M-25 concrete and Fe-415 steel. Also assume that exposure condition to environment can be classified as mild.　　　12

Q.7. Design an isolated square footing for a column 400 × 400mm transmitting a load of 1000kN. The safe bearing capacity of soil is 120kN/m^2. Use M25 concrete and Fe-415 steel.　　　12

OR

Q.8. A short R.C.C. column has to carry an axial load of 500kN. It is having a square cross-section. Find the size of the column and reinforcement required for main bars as well as lateral ties. Use M20 grade of concrete and Fe-415 steel.　　　12

Q.9. Design a dog-legged stair for a building in which vertical distance between floor is 3.5m. The stair hall measures 2.5m × 5m. The live load is 4kN/m². Use M20 grade concrete and Fe-415 steel. **12**

OR

Q.10. Explain in detail (any three) **12**

a) Distinguish between 'factor of safety' and 'Partial safety factor'.

b) Explain the term 'balanced, over reinforced' section in bending. Explain which of these should be recommended in design.

c) Distinguish between one way and two way slab. How are they analysed for determining BM and SF under UDL?

d) Why is the span/effective depth ratio of slabs larger than that for beams?

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