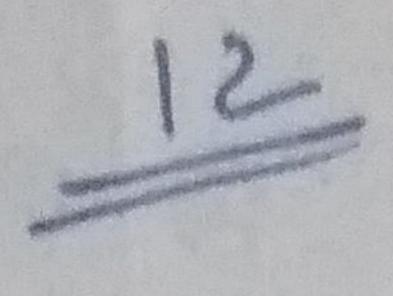
Total No. of Questions: 10



Total No. of Printed Pages: 3.

UITians

## EKS-333

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

# STRUCTURAL DESIGNAND 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.
  - 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.

YA17-231

EKS-333

P.T.O.

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.

### OR

- Q.4. Design 300 x 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.
- 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<sup>2</sup>. Use M-20 concrete and Fe-415 steel.

#### OR

- Q.6. Design a reinforced concrete slab 6.3 x 4.5m simply supported on all the four edges. If has to carry a characteristic live load of 10kN/m². 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.
- 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/m². 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.

YA17-231.

EKS-333

Contd ....

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.

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?

