

ISN 09ENG55

## Fifth Semester B.Arch. Degree Examination, June/July 2023 Structures - V

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions.

- 2. Use of IS 456-2000 and SP: 16 are permitted.
- 3. Unless specified adopt limit state method of design.
- What are the advantages of R.C.C. as a structural material? 1

(08 Marks)

- State and explain the following:
  - i) Concrete mix design
  - ii) Water cement ratio
  - iii) Workability of concrete.

(12 Marks)

- Differentiate between single reinforced and Doubly reinforced R.C beams. (05 Marks)
  - b. A rectangular R.C beam 400 × 600mm is reinforced with 4 nos 22mm dia bars with clear cover of 20mm. If M20 concrete and Fe415 Steel are used, calculate the moment of resistance of the beam. Use any method. (15 Marks)
- 3 Design the necessary reinforcement for a R.C. beam 230 × 450mm. The beam is to carry a udl of 20kN/m over a span of 4.0mt. Use M20 concrete and Fe415 steel. Take f' = 40mm.
- 4 Design the necessary reinforcement for a R.C beam 300 × 450mm to carry a udl of 25kN/m over a clear span of 4.0m. The beam is simply supported over a 400mm thick wall at ends. Use M20 concrete and Fe415 steel. (Sketch the details c/s only). Adopt limit state method. Assume effective cover 40mm.
- Design the necessary reinforcement for a RC beam 300 × 450mm to carry a udl of 25kN/m 5 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)
- Design the necessary reinforcement for a RC column 300mm × 400mm subjected to an axial 6 design load of 1600kN. Use M20 concrete and Fe415steel. Adopt limit state method sketch the c/s. (20 Marks)
- 7 Design an R.C. footing for a column 400mm × 400mm to carry an axial load of 1600kN. Use M<sub>20</sub> concrete and Fe415 steel. Bearing capacity of soil is 220kN/m<sup>2</sup>. Sketch the reinforcement details. (20 Marks)
- Explain the following with respect to design of stairs as per IS 456 2000. 8
  - Rise and Tread a. (02 Marks)
    - Waist slab (02 Marks)

  - Effective span (08 Marks) Distribution of loading on stairs. (08 Marks)

\* \* \* \* \*