

23379

M. Tech 1st Semester, (Civil Engineering)

Examination, December-2023

**ADVANCED REINFORCED CONCRETE DESIGN
(ELECTIVE-1)**

Paper-CE-614

Time allowed : 3 hours]

[Maximum marks : 100

Before answering the questions, candidates should ensure that they have been supplied correct and complete question paper, No complaint in this regard, will be entertained after examination.

Note : Attempt five questions. All questions carry equal marks.

1. (a) What are the major factors which influence crack-widths in flexural members? 10
(b) A beam of width 450 mm, depth 700 mm cover of reinforcement 40 mm is reinforced with 3 rods of 40 mm diameter. Determine the crack width when the section is subjected to a BM of 490 kNm at a point on the side of the beam 250 mm below the neutral axis. 10
2. A six storey bay building is to be located at Vishakhapatnam. Determine lateral forces and storey shears on an inner frame due to wind loads (IS 875-1987) (Part-3) and Earthquake loads (IS 1893-1984) using the following data: Bay width = 6.0 m c/c, frame spacing = 5m c/c, height of ground floor-4m, height of other floors = 3.0 m, floor thickness = 15 cm, floor finish = 4cm, Outer columns = 30cm × 50cm, Inner columns = 35 cm × 65 cm Girders below floor slab = 30 cm × 35 cm, Live load = 5 kN/m². 20

3. (a) State stipulation of IS 456 regarding the control of deflection. 10
- (b) How would you select preliminary dimensions of structures to satisfy 10
- (a) Deflection requirements
- (b) The lateral stability
4. With help of neat sketch explain transfer of force through beam column joint. 20
5. Step by step explain design of building frames for earthquake loads. 20
6. Explain ductile detailing of beam as per IS 13920-1993. 20
7. Design a simply supported deep beam to the following data: Clear span = 4.20 m, Bearing at each end = 450 mm, Overall depth = 3500 mm, Width of beam = 250 mm, Super imposed load = 250 kN/m, Use M20 concrete and Fe415 steel. 20
8. (a) Briefly explain the classifications of shear wall with neat sketch? 10
- (b) Explain the design procedure to design the shear wall? 10