

# CBCS SCHEME

17CV72



## Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any One full question from each module.  
2. Use of IS456:2000, IS800:2007, SP-16 and steel tables may be permitted.*

### Module-1

- 1 Design a rectangular combined footing for two RCC columns separated by a distance of 4m center to center. First column is  $500 \times 500$ mm and carries a factored load of 1250kN, second column is  $600 \times 600$ mm and carries factored load of 1600kN. Take SBC of soil as  $200\text{kN/m}^2$ . Use M20 grade concrete and Fe415 grade steel. Sketch the details. (50 Marks)

OR

- 2 Design a cantilever retaining wall to retain an embankment for a height of 4m above the ground level. Density of back fill is  $16\text{kN/m}^3$ , SBC of soil below the base slab is  $150\text{kN/m}^2$ , angle of repose is  $30^\circ$ , coefficient of friction is 0.55. Use M20 grade concrete and Fe415 steel. Sketch the details. (50 Marks)

### Module-2

- 3 Design a simply supported welded plate girder for a span of 20m. It carries a UDL of  $40\text{kN/m}$ . Design the girder with intermediate stiffness and end bearing stiffeners. (50 Marks)

OR

- 4 Design a gantry girder for an industrial shed to support an electrically operated crane using following data:
- Crane capacity = 250kN
  - Weight of crab = 80kN
  - Weight of crane girder = 300kN
  - Minimum approach of crane hook = 1m
  - Span of crane girder = 18m
  - Span of gantry girder = 6m
  - Wheel base of crane = 3m
  - Weight of rails =  $0.25\text{kN/m}$
  - $f_y = 250\text{N/mm}^2$ .
- (50 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg,  $42+8=50$ , will be treated as malpractice.