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Seventh Semester B.E. Degree Examination, Dec.2024/Jan.2025 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of IS 456, SP-16, IS 800 and steel tables is permitted.*

Module-1

- 1 Design slab-beam type combined footing for two RCC columns A and B separated by a distance of 4m c/c. Column A is 500 × 500 mm and carries a load of 1250 kN. Column B is 600 × 600 mm and carries a load of 1600 kN. SBC of soil is 200 kN/m². Use M20 concrete and Fe 415 steel. Restrict the width of footing to 2.5 m. Also sketch the details. (50 Marks)

OR

- 2 Design a RCC cantilever retaining wall to retain an earth embankment of 4 m high above ground level. Density of earth is 18 kN/m³ and angle of repose is 30°. Embankment is horizontal at top. SBC of soil is 200 kN/m². Co-efficient of friction between soil and concrete is 0.5. Adopt M 20 and Fe 415 steel. (50 Marks)

Module-2

- 3 Design a roof truss shown in Fig.Q.3 with service forces in each member along with its nature. Also design end with Gusset plate using black bolt of property class 4.6. Also design the supports consisting of shoe angle and bearing plate by considering support reaction of 150 kN. Anchor bolts are subjected to an uplift of 15 kN at each support. (50 Marks)

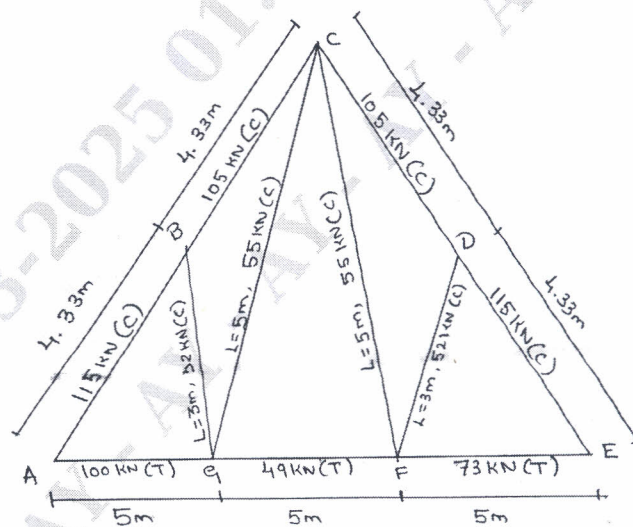


Fig.Q.3

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.

OR

4 Design a simply supported Gantry girder to carry an electrically operated moving crane with following data:

- i) Span of crane bridge = 22 m
- ii) Column spacing = 6.5 m
- iii) Wheel base = 2.5 m
- iv) Crane capacity = 220 kN
- v) Weight of crane bridge = 130 kN
- vi) Weight of trolley = 55 kN
- vii) Minimum Hook distance = 1 m
- viii) Weight of rail = 0.25 kN/m
- ix) Height of rail = 100 mm.

(50 Marks)
