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Course Code

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Seventh Semester B.E. Degree Examinations, February 2025

ADVANCED DESIGN OF RCC AND STEEL STRUCTURES

Duration: 3 hrs

Max. Marks: 100

- Note:** 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any, may be suitably assumed
3. Use of IS-456, IS-800, SP-16, SP-6 and steel table are permitted.

Q. No Question Marks (RBTL:CO:PI)

Module-1

1. Design a reinforced concrete combined rectangular slab footing for two columns are C1 and C2 with 400 mm × 400 mm and 500 mm × 500 mm is carrying 500 kN and 800 kN of load respectively. The smaller column is 0.4 m away from centre to left side of footing and the columns are 4 m apart c/c. The safe bearing capacity of soil is 140 kN/m². Use M-25 concrete and Fe-415 steel. 50 (4 : 1 : 3.1.4)

(OR)

2. Design a RCC Portal frame having an effective span 10 m and effective height is 4 m. The portal frame is spaced at 4 m c/c. Live load on roof = 1.5 kN/m², SBC of soil = 200 kN/m². The base of the column may be assumed as hinged. Adopt M-20 grade concrete and Fe-415 steel. 50 (4 : 3 : 3.1.4)

Module-2

3. Design a welded plate girder, effective span of 18 m is simply supported at its ends. It carries a uniformly distributed load of 60 kN/m in addition to its two point loads each of magnitude 400 kN placed at one third span points. Design (i) Cross section of plate girder at mid-span (ii) End and intermediate stiffeners (iii) Welded connection between flange and web (iv) Welded connection between web and stiffeners. 50 (4 : 4 : 3.1.4)

(OR)

4. Design a roof truss as shown in Fig. Q4 with force in each member along with its nature also design supports consisting of shoe angle at bearing plate by considering support reaction 150 kN, anchor bolts are subjected to uplift force of 15 kN at each support use M-20 concrete, bearing pressure of concrete 4 N/mm². 50 (4 : 5 : 3.1.4)

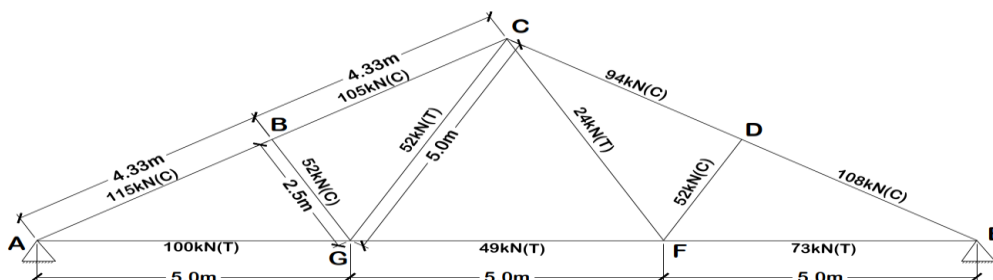


Fig. Q4

Note:- C-Compression and T-Tension

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