



CBCS SCHEME

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Seventh Semester B.E. Degree Examination, July/August 2022 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any ONE full question from module – 1 and module - 2.
2. Use of IS 456, IS-800, SP 6(1); SP-16 and steel tables are permitted.

Module-1

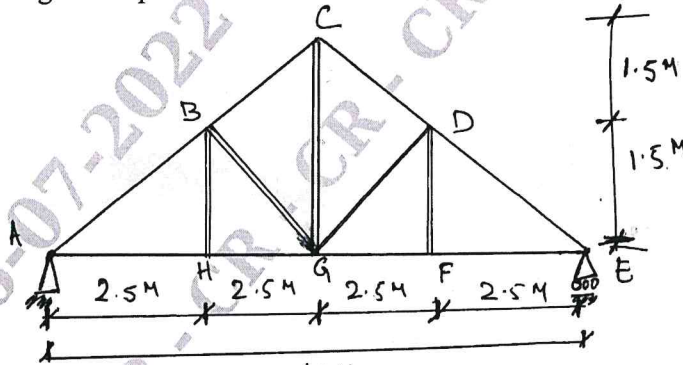
- 1 Design a slab type rectangular combined footing for two columns of size 300 mm × 450 mm and 300 × 600 mm, subjected to axial loads of 650 kN and 900 kN respectively. The columns are spaced at 3.6 m c/c. The width of the footing is restricted to 1.8 m. Use M20 grade concrete and Fe-415 grade steel. Assume SBC of soil = 160 kN/m². (50 Marks)

OR

- 2 Design a RCC portal frame having an effective span of 8m and an effective height of 5m. The portal frames are spaced at 4 m c/c. The live load on slab is 3 kN/m². Assume SBC of soil as 120 kN/m². The base of column are fixed. Use M20 grade concrete and Fe 415 steel. Assume floor finish is 1 kN/m². Draw suitable sketches showing reinforcement details. (50 Marks)

Module-2

- 3 Design a steel roof truss with its geometry as shown in Fig.Q3. The analysed forces in the rafter (principal), principal tie and for major sling member. Determine the maximum design forces due to load combinations as per IS800 for the above mentioned members and design the same members with all the necessary checks including for reversal of stresses. Use 16 mm diameter bolt of grade 4.6 for the member end connections. Write a neat sketch of the design describing all the parts. Steel section available is Fe 410 grade.



10M
Fig.Q3

Member	Length (m)	Dead Load (kN)	Live load (kN)	Wind load (kN)
Rafter (AB)	2.92	-58.0	-52.50	+111.6
Tie (AH)	2.50	+52.0	+47.00	-102.4
Sling (Bg)	2.92	+20.3	+18.40	-63.0

Note: + → Tensile force - → Compressive force

(50 Marks)

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.

