

CBCS SCHEME

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15CV72

Seventh Semester B.E. Degree Examination, Aug./Sept.2020 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 Design a slab type rectangular combined footing for two columns, A = 350 mm × 350 mm and B = 400 mm and 400 mm in size to carry axial service load of 600 kN and 900 kN respectively. The columns are spaced at 3.6 m centre to centre. SBC of soil is 175 kN/m². The property line is 0.74m from centre of column A. Use M20 grade concrete and Fe-415 grade steel. (40 Marks)

OR

- 2 Design a single bay portal frame, fixed at the base for the following data:
Effective span of portal frame = 10 m
Spacing of portal frame = 4 m
Height of column above footing = 5.5 m (effective)
Thickness of slab to be adopted = 150 mm
Live load on slab = 1.6 kN/m²
Floor finish = 0.75 kN/m²
SBC of soil = 200 kN/m²
Use M20 grade concrete and Fe 415 steel. Design the slab, beam, column and footing. (40 Marks)

Module-2

- 3 The centre line of a roof truss is as shown in Fig.Q3. The magnitude and nature of forces under service conditions are :
Top Chord members = 120 kN Compression
Bottom Chord members = 100 kN Tension
Interior members = 60 kN Tension and 50 kN Compression
For all the interior members use similar single angle sections. Design all the members and joints using M₁₆ turned bolts of grade 4.6. Also design bearing plate, base plate and anchor bolts to connect the truss to an RCC column 300 mm × 300 mm of M₂₀ grade concrete.

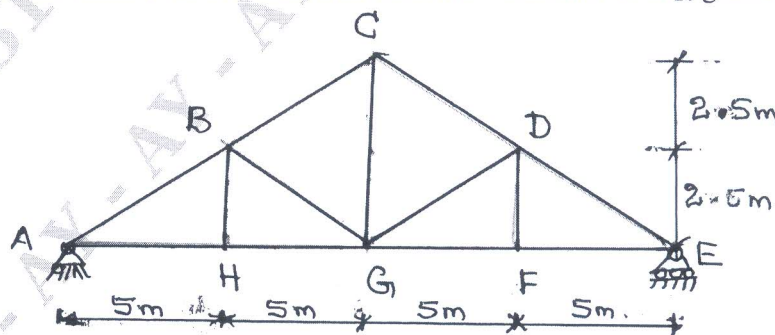


Fig.Q3

(40 Marks)

OR

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

(40 Marks)

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