

# CBCS SCHEME

15CV72

## Seventh Semester B.E. Degree Examination, June/July 2024 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, IS-3370, SP(6)-steel tables is permitted.  
3. Any missing data may be assumed suitably.

### Module-1

- 1 a. Name the different types of retaining walls. (04 Marks)  
b. Design a combined footing for two interior columns carrying axial loads 1000kN and 1200kN. Column A is 400mm × 400mm in size and column B is 450mm in diameter. They are reinforced with 20mm bars and are spaced 4m centre to centre as for a bearing capacity of the soil is 120 kN/m<sup>2</sup>. Use M20 mix and Fe 415 grade steel. Sketch it. (36 Marks)

OR

- 2 a. Name the different classification of liquid retaining structures. (04 Marks)  
b. Roof of a 8m wide hall is supported on a portal frame spaced at 4m intervals. The height of the portal frame is 4m. The continuous slab is 120mm thick. Live load of roof is 1.5 kN/m<sup>2</sup>, SBC of soil is 150 kN/m<sup>2</sup>. The columns are connected with a plinth beam and the base of the column may be assumed fixed. Design the slab, column, beam members for the columns of the portal frame. Use M20 and Fe415 grade steel. Sketch the details. (36 Marks)

### Module-2

- 3 The centre line of a roof truss is as shown in Fig.Q.3. 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 M<sub>16</sub> 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 M<sub>20</sub> grade concrete.

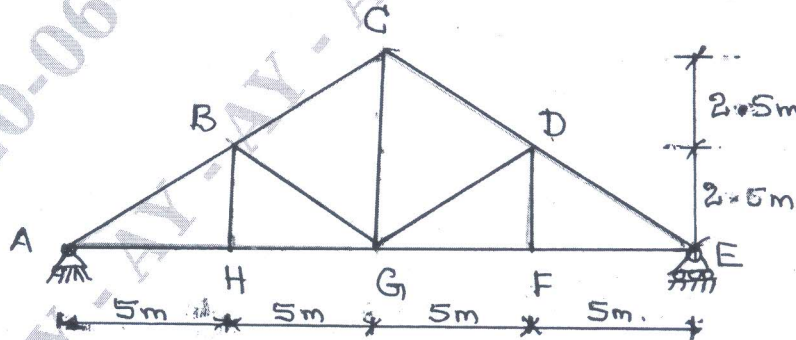


Fig.Q.3

(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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