

Max. Marks: 80

**Note:** 1. Answer any TWO full questions, choosing ONE full question from each module.  
 2. Use of IS456, IS3370, Part IV, SP(6), IS800-2007, steel tables permitted.

**Module-1**

1. Roof of a 8 m wide hall is supported on a portal frame spaced at 3 m intervals. The height of portal frame is 4 m. The continuous slab is 120 mm thick. LL = 1.5 KN/m<sup>2</sup>, SBC = 150 KN/m<sup>2</sup>. The columns are connected with a plinth beam and column base is fixed. Design the column and beam members. Adopt M20, Fe415 steel. (40 Marks)

OR

2. Design a rectangular water tank 5 m×4 m with depth of storage 3 m. Tank is resting on ground, walls being rigidly attached at vertical and horizontal edges. Assume M20 and Fe415 steel. Also indicate by rough sketch (without scale) reinforcement details. (40 Marks)

**Module-2**

3. Design a welded plate girder for an effective span of 14 m. Girder has udl of 45 kN/m in addition to two point loads of 400 kN each acting at 3 m on either side of mid span point of the girder. Draw suitable sketches wherever necessary without scale. (40 Marks)

OR

4. Centre line diagram of a steel roof truss is shown in Fig. Q4. Assume M25 grade concrete. Bearing pressure be 0.45 f<sub>ck</sub>. Design the truss and bearing plate, Anchor bolt for an upward support reaction of 150 KN, uplift force = 30 KN. Adopt M18 black bolts for connections. (40 Marks)

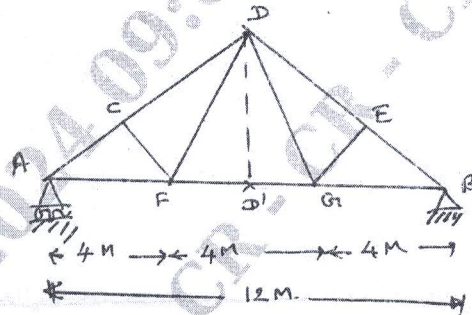


Fig. Q4

Member	Force (KN)	Length (m)
AC, EB	-114	3.46
CD, DE	-99	3.46
AF, GB	+99	4.00
FG	+71	4.00
CF, EG	-34	2.00
DF, DG	+34	4.00

- ve → Compression  
 + ve → Tension

(40 Marks)

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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.