CBCS SCHEME

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15CV72

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.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 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^2, SBC = 150 KN/m^2. 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 fck. 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.

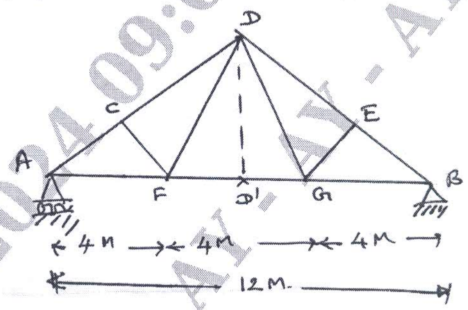

Fig. Q4

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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