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

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any TWO full questions, choosing ONE full question from each module.
2. Use of IS456, IS-800, SP(6) and steel tables are permitted.

Module-1

- 1 Design a combined footing slab beam type for two RCC column A and B separated by a distance of 4 m C/C. Column A is 500×500 mm and carries a load of 1250 kN and column B is 600×600 mm and carries a load of 1600 kN. Take SBC of soil is 200 kN/m². Use M20 concrete and Fe415 steel. Draw the sectional elevation. (50 Marks)

OR

- 2 Design a Cantilever retaining wall to retain earth embankment 5 m high above ground level. The density of earth is 18 kN/m³ and its angle of repose is 30°. The embankment is horizontal at its top. The SBC of soil may be taken as 200 kN/m² and the co-efficient of friction between soil and concrete is 0.5. Adopt M20 grade concrete and Fe415 steel. Also draw cross sectional elevation showing reinforcement details. (50 Marks)

Module-2

- 3 A line diagram of a roof truss with internal loads and forces in each member are shown in Fig. Q3. Design the various members of the roof truss along with their end connection with bolt of property class 5.6. Also design the bearing plate at support for the reaction and anchor bolts for an uplift force of 15 kN. Also draw the Elevation of truss greater than half plan.

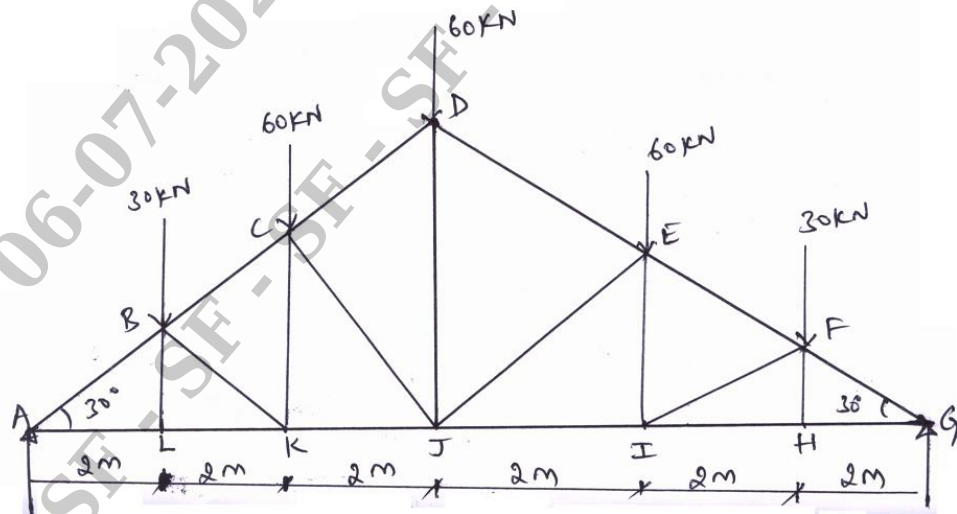


Fig. Q3
1 of 2

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.



Members	Length (m)	Force (kN)	Nature of force
AB, GF	2.31	240	C
BC, FE	2.31	210	C
CD, ED	2.31	160.04	C
AL, GH	2.0	207.84	T
LK, HI	2.0	207.84	T
KJ, IJ	2.0	181.82	T
BL, FH	1.154	0	-
BK, FI	2.31	30	C
CK, EI	2.31	15	T
CJ, EJ	3.05	66	C
DJ	3.46	60	C

(50 Marks)

OR

- 4 Design a simply supported gantry girder to carry an electrically operated crane with the following data:

Span of Crane bridge = 25 m

Span of gantry girder = 8 m

Wheel base = 3.5 m

Crane capacity = 200 kN

Weight of crane bridge = 150 kN

Weight of trolley = 75 kN

Min Hook distance = 1.0 m

Weight of rail = 0.30 kN/m

Height of rail = 105 mm

Draw the sectional elevation.

(50 Marks)

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