

--	--	--	--	--	--	--	--	--	--

First Semester B. Arch. Degree Examination, Dec.2024/Jan.2025 Building Structures – I

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Write important properties of steel, wood Aluminium and glass. (12 Marks)
- b. What are the tests conducted on fresh and hardened concrete. (08 Marks)

OR

- 2 a. Explain the following :
i) Seismic load ii) Wind load iii) Thermal load iv) Settlement load. (12 Marks)
- b. Describe the concept of load path and tributary load. Indicate load path diagram for a building. (08 Marks)

Module-2

- 3 a. Explain the following with neat diagram.
i) Law of triangle of force and law of polygon of force.
ii) Resolution and composition of forces
iii) Coplanar and Non-coplanar forces. (09 Marks)
- b. Determine the magnitude and direction of the resultant force shown in Fig Q3(b). Represent the Equilibrant force. (11 Marks)

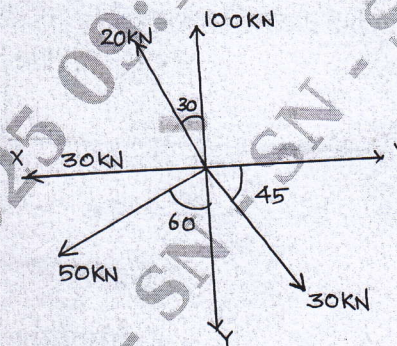


Fig Q3(b)

(11 Marks)

OR

- 4 a. What is free body diagram? For the three illustrations given draw the free body diagram.
i) Ladder resting on a rough wall and rough floor
ii) Beam resting on a hinge at one end and roller on the other
iii) Bulb hanging on two cable on either side. (08 Marks)
- b. State Lami's Theorem. (02 Marks)

- c. A sphere of mass 75kN is placed in V groove of a wooden block as shown in Fig 4(c). Determine the reactions on the block.

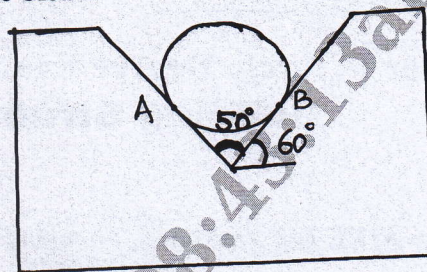


Fig Q4(c)

(10 Marks)

Module-3

- 5 a. Explain couple and write characteristics of a couple. (06 Marks)
- b. State Varignon's theorem. (02 Marks)
- c. A system of loads acting on a beam is shown in Fig Q5(c), Determine the resultant in magnitude, direction and position.

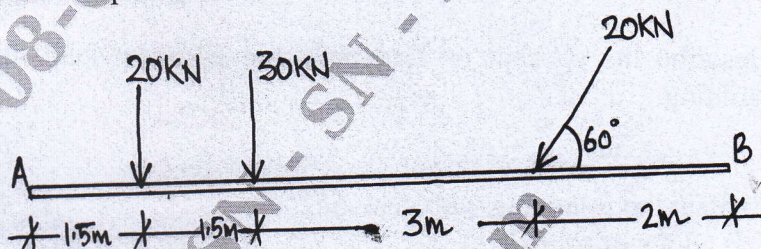


Fig Q5(c)

(12 Marks)

OR

- 6 a. Explain different types of supports and loads. (08 Marks)
- b. Determine the support reaction for the beam shown in Fig Q6(b).

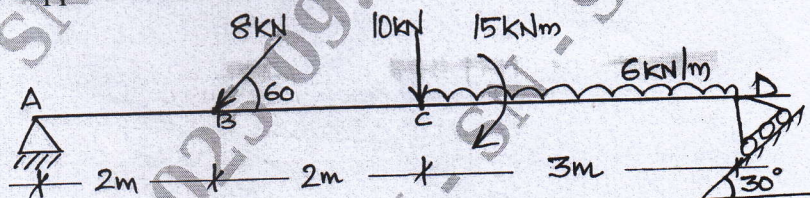


Fig Q6(b)

(12 Marks)

Module-4

- 7 Locate the centroid for the Fig Q7(i) and Fig Q7(ii). (20 Marks)

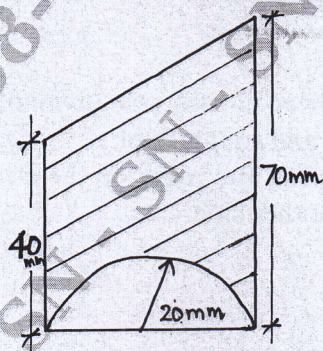


Fig Q7(i)

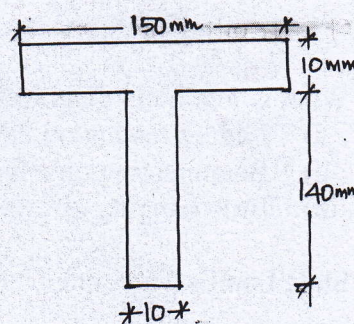


Fig Q7(ii)

OR

- 8 Find the least radius of gyration of the plane lamina shown in Fig Q8.

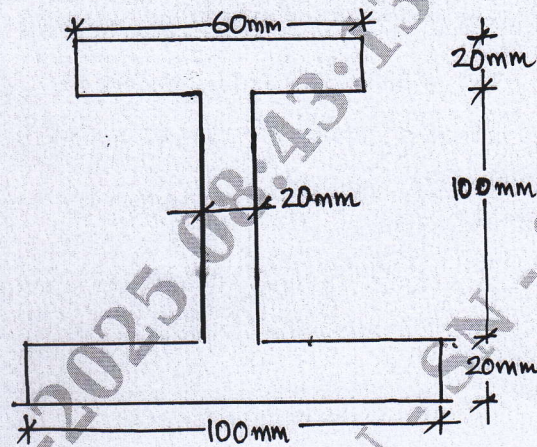


Fig Q8

(20 Marks)

Module-5

- 9 a. What are the assumptions made in analysis of truss? (06 Marks)
 b. Briefly explain the method of joints in truss analysis. (14 Marks)

OR

- 10 a. With examples, explain briefly the following : (09 Marks)
 i) Perfect frame
 ii) Deficient frame
 iii) Redundant frame
 b. Analyse the truss shown in Fig Q10(b) by method of joints. Tabulate the result and indicate the nature of force in truss.

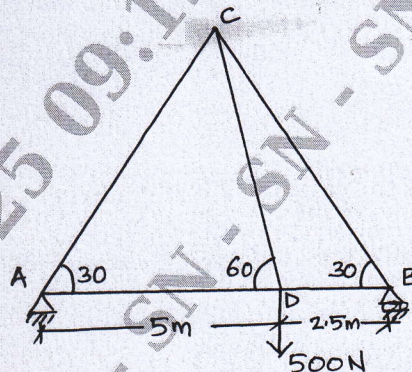


Fig Q10(b)

(11 Marks)
