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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 : (12 Marks)
 - i) Seismic load ii) Wind load iii) Thermal load iv) Settlement load.
- 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. (09 Marks)
 - i) Law of triangle of force and law of polygon of force.
 - ii) Resolution and composition of forces
 - iii) Coplanar and Non-coplanar forces.
- b. Determine the magnitude and direction of the resultant force shown in Fig Q3(b). Represent the Equilibrant force.

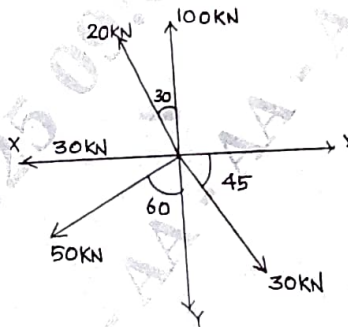


Fig Q3(b)

(11 Marks)

OR

- 4 a. What is free body diagram? For the three illustrations given draw the free body diagram. (08 Marks)
 - 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.
- 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.

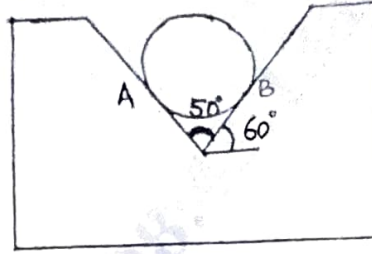


Fig Q4(c)

(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.

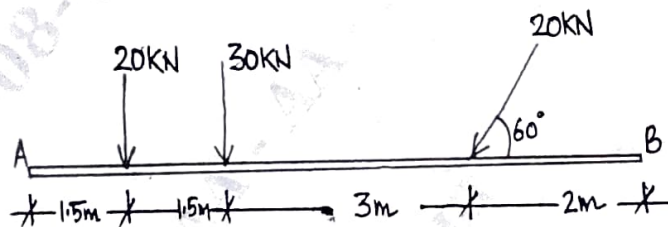


Fig Q5(c)

(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).

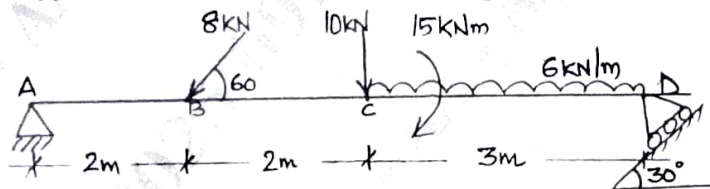


Fig Q6(b)

(12 Marks)

Module-4

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

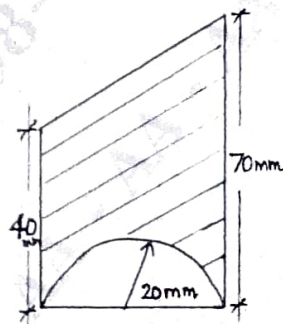


Fig Q7(i)

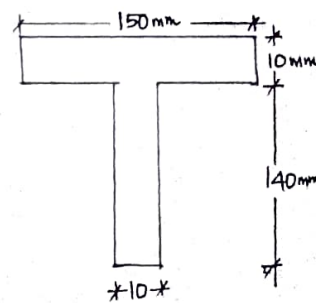


Fig Q7(ii)

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

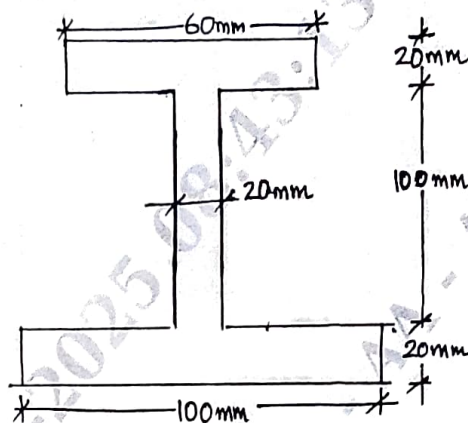


Fig Q8

(20 Marks)

Module-5

- 9 a. What are the assumptions made in analysis of truss?
b. Briefly explain the method of joints in truss analysis.

(06 Marks)

(14 Marks)

OR

- 10 a. With examples, explain briefly the following :
i) Perfect frame
ii) Deficient frame
iii) Redundant frame

(09 Marks)

- b. Analyse the truss shown in Fig Q10(b) by method of joints. Tabulate the result and indicate the nature of force in truss.

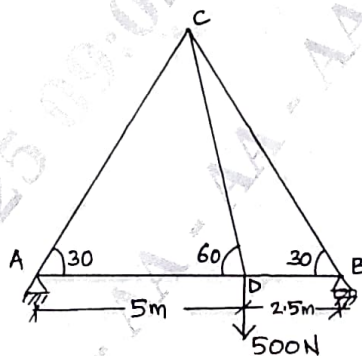


Fig Q10(b)

(11 Marks)
