CBCS SCHEME

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21ENG26

Second Semester B.Arch. Degree Examination, Dec.2023/Jan.2024
Building Structures – I

Time: 3 hrs. Max. Marks: 100

Note: 1.Answer any FIVE full questions, choosing ONE full question from each module.
2.Assume any missing data suitably.

Module-1

1 a. What are the important properties of steel? Also mention the advantages and disadvantages of steel. **(10 Marks)**

b. Explain dead load, live load, earthquake load and impact load. **(10 Marks)**

OR

2 a. Explain workability of concrete and factors affecting the workability of concrete. **(08 Marks)**

b. Write important properties of wood, glass and aluminium. **(12 Marks)**

Module-2

3 a. Explain the principle of transmissibility. **(05 Marks)**

b. Differentiate between law of triangle of force and law of polygon of forces. **(05 Marks)**

c. Five coplanar forces are acting at a point shown in Fig.Q3(c). Determine the resultant in magnitude and direction.

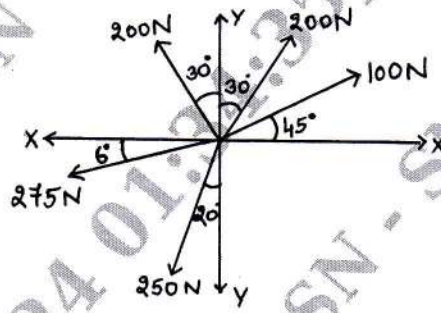

Fig.Q3(c) **(10 Marks)**

OR

4 a. Briefly explain force system and classification of force system. **(10 Marks)**

b. Two forces of 800N and 600N act at a point as shown in Fig.Q4(b). The resultant of the two forces is 1200N. Determine θ between the forces and the direction of the resultant.

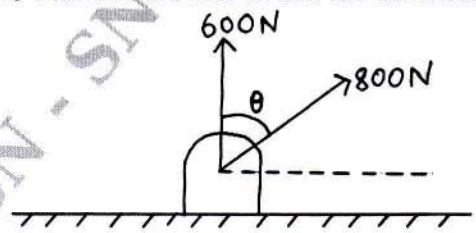

Fig.Q4(b) **(10 Marks)**

Module-3

5 a. Define couple and explain characteristics of.couple. **(05 Marks)**

b. Determine the magnitude, direction of the resultant force for the force system shown in Fig.Q5(b). Locate the resultant force with respect to point D. (15 Marks)

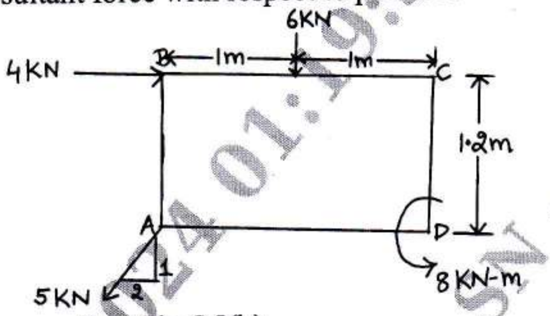

Fig.Q5(b)

OR

6 a. What are the different types of supports? Briefly explain with sketches. (10 Marks)

b. The beam AB of span 12m shown in Fig.Q6(b) is hinged at A and is on rollers at B. Determine the support reactions at A and B.

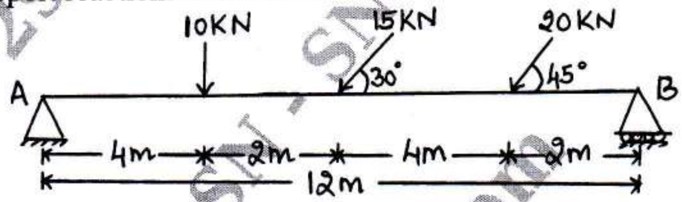

Fig.Q6(b) (10 Marks)

Module-4

7 a. Determine the centroid of the area shown in Fig.Q7(a) with respect to the axis shown.

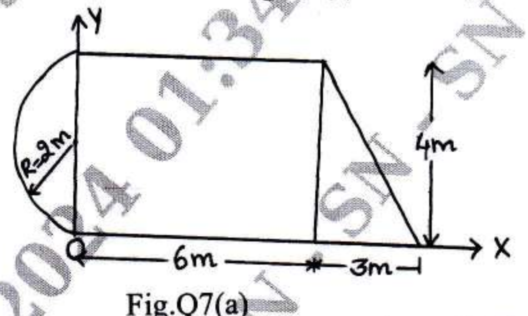

Fig.Q7(a) (10 Marks)

b. A semi circle of 90mm is cut out from a trapezium as shown in Fig.Q7(b). Find the position of centre of gravity of the figure.

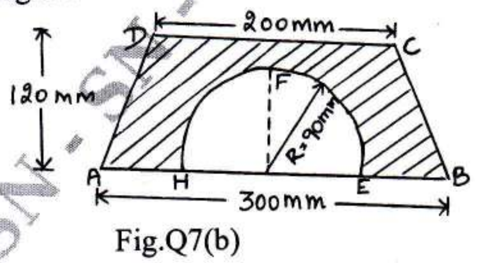

Fig.Q7(b) (10 Marks)

OR

8 a. State parallel axis theorem and perpendicular axis theorem. (06 Marks)

b. Find the moment of inertia along the horizontal axis and vertical axis passing through the centroid of section shown in Fig.Q8(b).

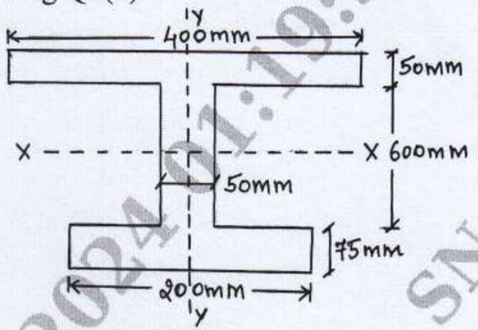

Fig.Q8(b) **(14 Marks)**

Module-5

9 a. Explain briefly analysis of truss by method of joints. **(10 Marks)**

b. List the assumptions made in analysis of truss. **(05 Marks)**

c. With neat sketches explain perfect frames, deficient frame and redundant frame. **(05 Marks)**

OR

10 Determine the force in all the members of the truss shown in Fig.Q10 and indicate the magnitude and nature of forces on the diagram of truss. All inclined members are at 60° to horizontal and length of each member is 2m.

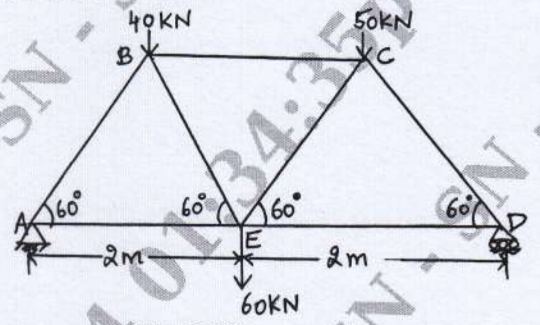

Fig.Q10 **(20 Marks)**

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