CBCS SCHEME

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21ENG26

Second Semester B.Arch. Degree Examination, Jan./Feb. 2023
Building Structure – I

Time: 3 hrs. Max. Marks: 100

Note: 1.Answer any FIVE full questions, choosing ONE full question from each module.
2.Sketches are mandatory.

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.

Module-1

1 a. What is plain cement concrete? What are the advantages and disadvantages of concrete and steel? **(10 Marks)**

b. What is Durability of concrete? What are the factors that affect the durability of concrete? **(10 Marks)**

OR

2 a. Write important properties of Wood, Aluminium and Glass. **(12 Marks)**

b. Explain the following terms with example:
(i) Dead load (ii) Live load (iii) Impact load (iv) Earthquake load. **(08 Marks)**

Module-2

3 a. Define mechanics. Explain the classification of mechanics. **(05 Marks)**

b. Explain principle of transmissibility of forces. **(05 Marks)**

c. Two wires are attached to a bolt in a foundation as shown in Fig.Q3(c). Determine the pull excreted by the bolt on the foundation.

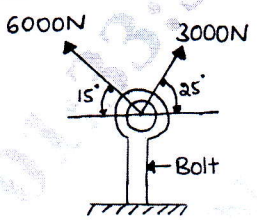

Fig.Q3(c) **(10 Marks)**

OR

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

b. Determine the magnitude and direction of the resultant for the system of forces shown in Fig.Q4(b).

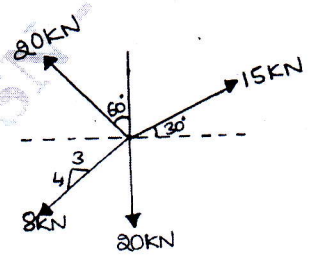

Fig.Q4(b) **(10 Marks)**

Module-3

5 a. Define couple. Explain the characteristics of couple. **(05 Marks)**

b. Explain statically determinate and indeterminate structure. **(05 Marks)**

c. Find the magnitude and direction and distance of the resultant from the point 'A' for the system of forces shown in Fig.Q5(c). **(10 Marks)**

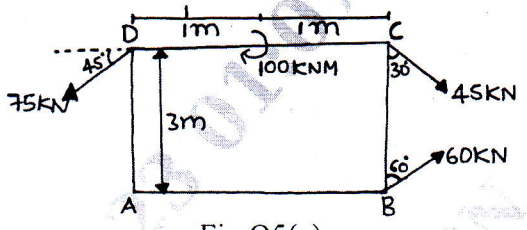

Fig.Q5(c)

OR

6 a. Explain different types of supports and loads with neat sketches. **(10 Marks)**

b. For the beam with loading shown in Fig.Q6(b). Determine the reactions at the supports.

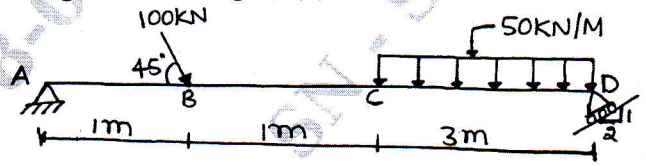

Fig.Q6(b) **(10 Marks)**

Module-4

7 a. Explain the following terms with sketches:
i) Centre of gravity
ii) Centroid
iii) Radius of gyration
iv) Parallel axis theorem **(10 Marks)**

b. Locate the centroid of an area shown in Fig.Q7(b) with respect to OX and OY. All dimensions are in mm.

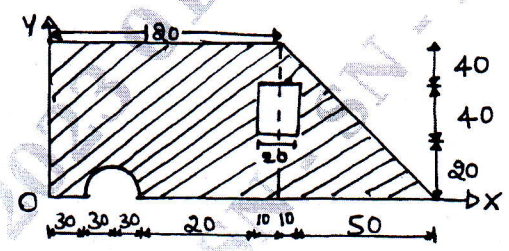

Fig.Q7(b) **(10 Marks)**

OR

8 a. Determine the radius of gyration about the centroidal axes for the Lamina shown in Fig.Q8(a). All dimensions are in mm.

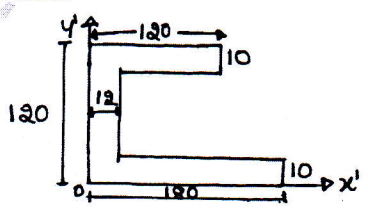

Fig.Q8(a) **(10 Marks)**

b. Determine the second moment of area about horizontal centroidal axis for shaded area shown in Fig.Q8(b). Also find the radius of gyration about the same axis. Take $R_1 = 50mm$ and $R_2 = 20mm$.

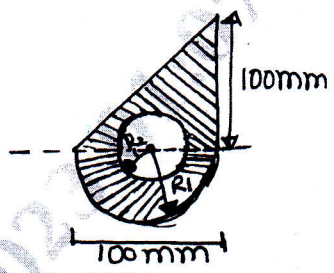

Fig.Q8(b) **(10 Marks)**

Module-5

9 a. What are the assumptions made in the analysis of trusses? **(05 Marks)**

b. Explain the following with examples:
(i) Perfect frame (ii) Deficient frame (iii) Redundant frame **(09 Marks)**

c. Determine reactions for the truss shown in Fig.Q9(c).

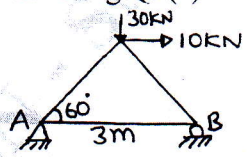

Fig.Q9(c) **(06 Marks)**

OR

10 Determine the force in each member by method of joints, mention the natural of force in each for the truss shown in Fig.Q10.

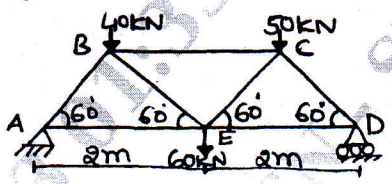

Fig.Q10 **(20 Marks)**

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