

CBCS SCHEME



21ENG26

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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.

Module-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

- 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

- 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 exerted by the bolt on the foundation.

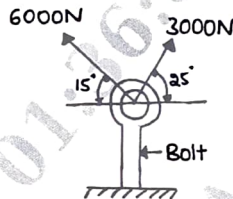


Fig.Q3(c)

(10 Marks)

OR

- 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).

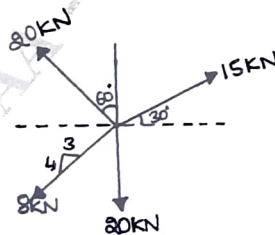


Fig.Q4(b)

(10 Marks)

Module-3

- a. Define couple. Explain the characteristics of couple. (05 Marks)
- b. Explain statically determinate and indeterminate structure. (05 Marks)

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.

- 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)

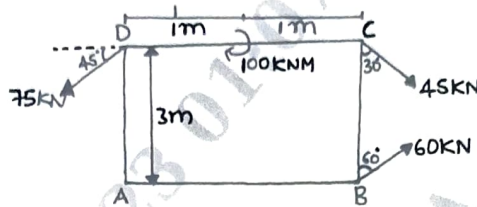


Fig.Q5(c)

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. (10 Marks)

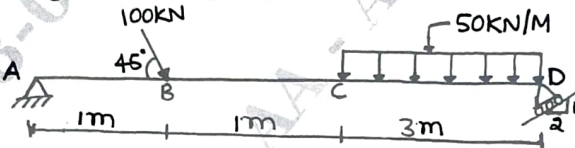


Fig.Q6(b)

(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.

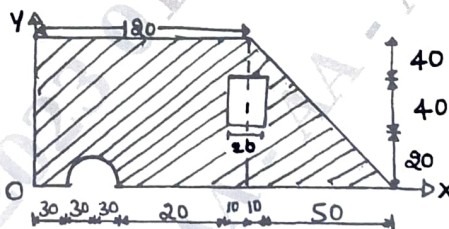


Fig.Q7(b)

(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.

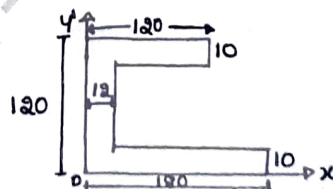


Fig.Q8(a)

(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 $R_1 = 50\text{mm}$ and $R_2 = 20\text{mm}$.

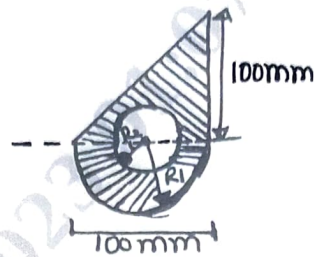


Fig.Q8(b)

(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).

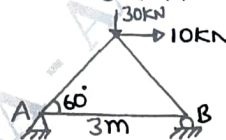


Fig.Q9(c)

(06 Marks)

OR

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

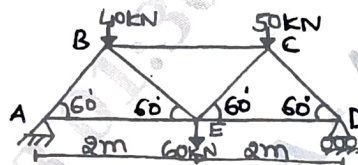


Fig.Q10

(20 Marks)
