

CBCS SCHEME

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15ENG15

First Semester B.Arch. Degree Examination, June/July 2023

Building Structures - I

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Follow written dimensions, do not scale the drawing.

Module-1

- 1 From the Premative times to Modern times explain in detail "How the Structures Evolved". (20 Marks)

OR

- 2 a. i) What is Reinforced Cement Concrete? (03 Marks)
ii) Mention important properties of steel and cement. (07 Marks)
b. What are the advantages of MILD STEEL and CONCRETE. (10 Marks)

Module-2

- 3 a. With neat sketch manmade cantilever and natural cantilever with examples. (08 Marks)
b. Show the load path and the way load gets transferred in case of manmade and natural cantilever. (12 Marks)

OR

- 4 a. Explain the following with example:
i) Dead load ii) Live load iii) Impact load iv) Earthquake load (10 Marks)
b. Determine the magnitude and direction of Resultant Force for concurrent force system shown in Fig.Q4(b).

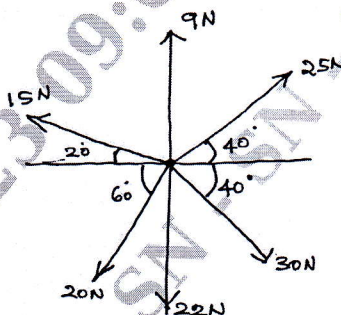


Fig.Q4(b)

(10 Marks)

Module-3

- 5 a. With neat sketch, explain different types of supports. (08 Marks)
b. For the beam shown in Fig.Q5(b), determine the Support Reactions.

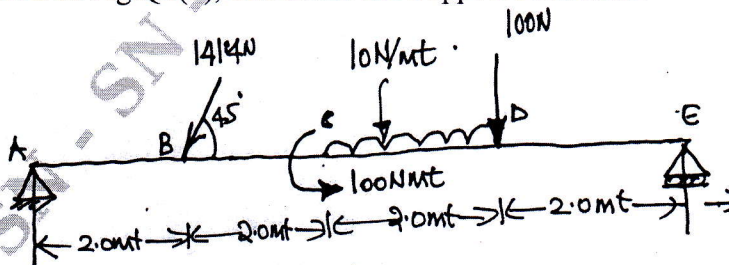


Fig.Q5(b)

(12 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.

OR

- 6 a. With neat sketch, explain different types of beams and classify them into statically determinate and statically indeterminate. (08 Marks)
 b. Find the resultant for given "Force System" and comment on your result. Refer Fig.Q6(b).

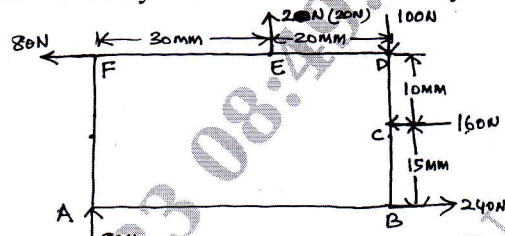


Fig.Q6(b)

(12 Marks)

Module-4

- 7 a. With neat sketch draw stress-strain curve for MS and Cast Iron. (10 Marks)
 b. A specimen of 25mm diameter with a gauge length of 200mm is tested to destruction. It has an extension of 0.16mm under a load of 80 kN and the load at elastic limit is 160 kN. The maximum load is 180 kN. The total extension at fracture is 56mm and diameter at neck is 18mm. Find
 i) Stress at elastic limit ii) Young's modulus iii) % Elongation
 iv) % Reduction in Area v) Ultimate Tensile stress (10 Marks)

OR

- 8 a. Explain the following :
 i) Normal stresses ii) Shear stresses iii) Bending stresses iv) Thermal stresses. (10 Marks)
 b. A bar shown in Fig.Q8(b) is testing in universal testing machine. It is observed that at a load of 40 kN, the total extension of the bar is 0.285 mm. Determine the Young's modulus of the material.

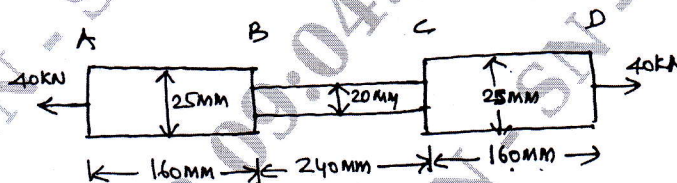


Fig.Q8(b)

(10 Marks)

Module-5

- 9 a. With neat sketch explain the following :
 i) Perfect frame ii) Deficient frame iii) Redundant frame (09 Marks)
 b. Mention the assumptions made in the analysis of frame. (03 Marks)
 c. A truss is shown in Fig.Q9(c), determine the support reactions and calculate the total weight, if each member has 2 angles 50x50x6 @ 4.5 kg/mt each

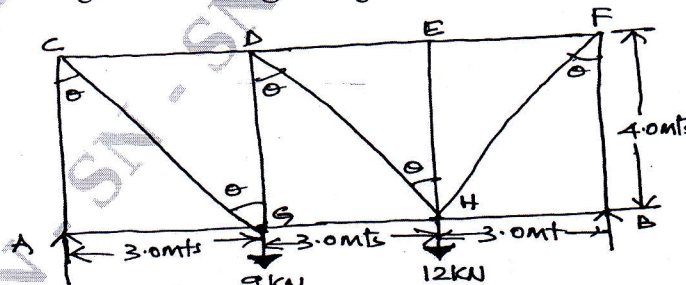


Fig.Q9(c)

(08 Marks)

OR .

- 10 Explain in detail the method of analyzing the truss with a neat sketch by
 i) Method of Joints ii) Method of Section (20 Marks)