

# CBCS Scheme

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15ENG1.5

## First Semester B.Arch. Degree Examination, June/July 2018 Building Structures – I

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer FIVE full questions, choosing one full question from each module.  
2. Follow written dimension do not scale the drawing.

### Module-1

- 1 Explain in detail "How the structures evolved" from pre-mative to modern times? (20 Marks)

OR

- 2 a. What are the advantages of MILD steel and concrete? (10 Marks)  
b. What is Reinforced cement concrete? Mention the important properties of cement and steel. (10 Marks)

### Module-2

- 3 a. With neat sketch explain Manmade Cantilever and natural Cantilever with examples. (08 Marks)  
b. Show the load path and load transfer 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) Earth quake load. (10 Marks)  
b. Determine the magnitude and direction of resultant for concurrent force system shown in Fig. Q4 (b). (10 Marks)

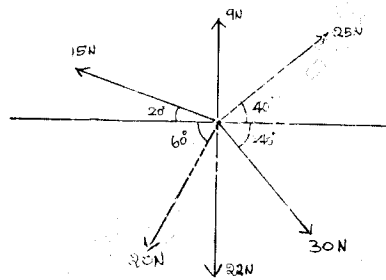


Fig. Q4 (b)

### Module-3

- 5 a. With neat sketch, explain different types of supports. (08 Marks)  
b. Determine the support reactions for the beam shown in Fig. Q5 (b). (12 Marks)

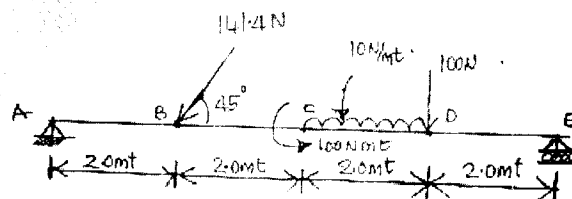


Fig. Q5 (b)

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). (12 Marks)

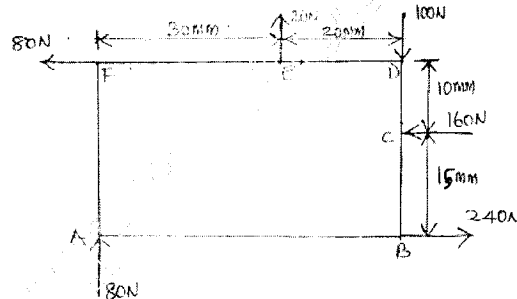


Fig. Q6 (b)

**Module-4**

- 7 a. With neat sketch draw stress-strain curve for mild steel and cast iron. (10 Marks)
- b. A specimen of steel 25 mm diameter with a gauge length of 200 mm is tested to destruction. It has an extension of 0.16 mm 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 56 mm and diameter at neck is 18 mm. 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 tested 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. (10 Marks)

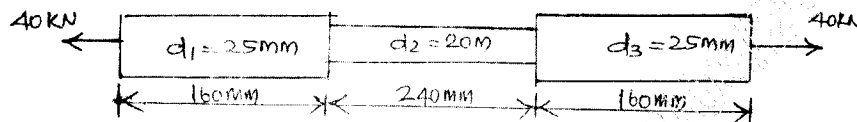


Fig. Q8 (b)

**Module-5**

- 9 a. With neat sketch, explain : (i) Perfect frame (ii) Deficient frame (iii) Redundant frame (08 Marks)
- b. Mention the assumptions made in analysis of frame. (03 Marks)
- c. A truss is shown in Fig. Q9 (c). Find the support reactions and calculate total weight if each member has  $\rightarrow$  2 angles  $50 \times 50 \times 6$  @ 4.5 kg/mt each angle. (09 Marks)

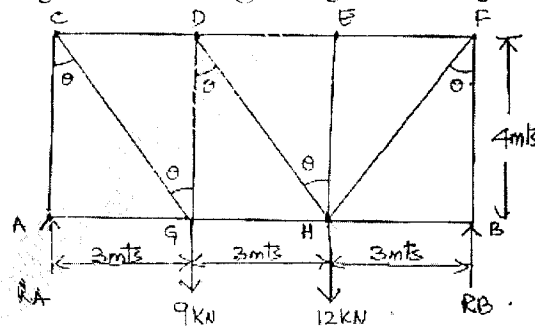


Fig. Q9 (c)

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)

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