

# CBCS Scheme

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15ENG1.5

## First Semester B.Arch. Degree Examination, Dec.2017/Jan.2018 Building Structures – I

Time: 3 hrs.

Max. Marks: 100

**Note:** Answer *FIVE* full questions, choosing one full question from each module.

### Module-1

- Explain “Structural System”. (08 Marks)
  - Explain load transfer mechanism in a building with sketches. (12 Marks)

OR

- Explain one way and two way structural systems with examples and sketches. (one dimensional and two dimensional). (12 Marks)
  - Sketch and explain “VAULT”. (08 Marks)

### Module-2

- Explain the following with examples:
  - Dead load. (07 Marks)
  - Imposed load. (07 Marks)
  - Thermal load. (06 Marks)

OR

- Explain the following with examples:
  - Static load. (07 Marks)
  - Dynamic load. (07 Marks)
  - Impact load. (06 Marks)

### Module-3

- State and explain “Principle of transmissibility of force”. (08 Marks)
  - Calculate the resultant of the force system shown. (12 Marks)

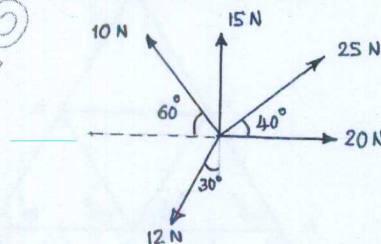


Fig. Q5 (b)

OR

- Explain the concept of compression, tension, bending and torsion with sketches. (08 Marks)
  - Calculate the reactions at the supports A and B of a beam shown. (12 Marks)

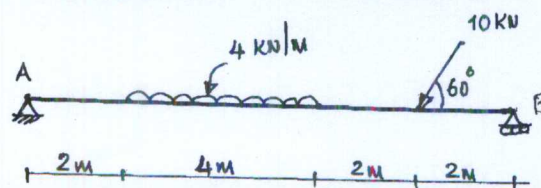


Fig. Q6 (b)

**Module-4**

- 7 a. Explain the terms stress, strain and Poisson's ratio. (06 Marks)  
 b. A bar 2000 mm long and 30 mm dia is subjected to an axial pull of 30 kN. If  $E = 2 \times 10^5 \text{ N/mm}^2$ , calculate stress, strain and elongation of the bar. (09 Marks)  
 c. Calculate the modulus of elasticity of the material of a bar of length 3000 mm and of dia 30 mm, subjected to a tensile load of 60 kN. The elongation of the bar is 0.4 mm. (05 Marks)

OR

- 8 a. State and explain "Moment of a force". (06 Marks)  
 b. State and explain equilibrium of coplanar concurrent and non-concurrent force system. (08 Marks)  
 c. State and explain "Lami's theorem". (06 Marks)

**Module-5**

- 9 a. Explain "Statically determinate truss". (04 Marks)  
 b. Explain "Statically Indeterminate truss". (04 Marks)  
 c. Calculate the reactions at the support A and B of the truss shown. (12 Marks)

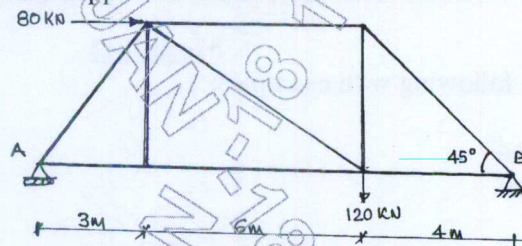


Fig. Q9 (c)

OR

- 10 a. With usual notations  $m = 2j - 3$ , explain the classification of trusses with examples for each. (09 Marks)  
 b. Calculate the weight of the truss shown if the members are ISA  $40 \times 40 \times 6$  and of 3.5 kg/m. (11 Marks)

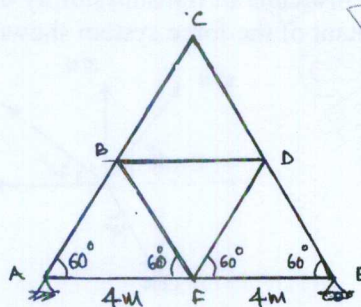


Fig. Q10 (b)

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