CBCS SCHEME

USN | | | | | | | | | | |

15ENG15

First Semester B.Arch. Degree Examination, July/August 2022
Building Structures – I

Time: 3 hrs. Max. Marks: 100

Note: *1. Answer any FIVE full questions, choosing one full question from each module.*
2. Assume any missing data suitably.

Module-1

1 a. Define Structures. Name and sketch some manmade and natural cantilever. **(10 Marks)**

b. Describe the properties and draw an arch roof (indicate load path and load transfer). **(10 Marks)**

OR

2 Draw and describe the structural principles of a typical building of your own choice (indicate load path and load transfer). **(20 Marks)**

Module-2

3 a. What are the ingredients used in plain concrete? Indicate the properties of the ingredients. **(10 Marks)**

b. What are advantages and disadvantages of i) wood ii) steel iii) concrete. **(10 Marks)**

OR

4 a. Explain Dead load, live load, impact load and earthquake load. **(10 Marks)**

b. Determine the magnitude and direction of resultant force from Fig Q4(b). **(10 Marks)**

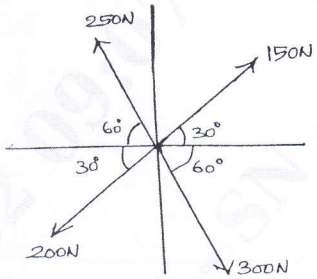

Fig Q4(b)

Module-3

5 a. Explain the principle of transmissibility of forces with an example. **(10 Marks)**

b. Prove Lami's theorem. **(10 Marks)**

OR

6 a. What are the different types of supports? Explain with neat sketches. **(10 Marks)**

b. Calculate the reactions @ A & E. [Refer Fig.Q.6(b)] **(10 Marks)**

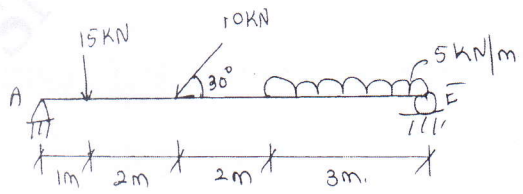

Fig.Q.6(b)

Module-4

7 a. Define Hooke's Law. **(05 Marks)**

b. A bar of 300mm length and of 15mm diameter is stretched by 0.8mm due to axial pull of 20kN. Calculate stress, strain and also modulus of elasticity. **(15 Marks)**

OR

8 a. Define law of parallelogram of forces and Varignon's theorem. **(10 Marks)**

b. Forces are acting along a equilateral triangle of side 1m. Calculate moment @ B. [Refer Fig. Q8(b)]

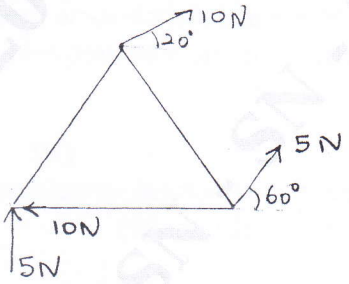

Fig. Q8(b) **(10 Marks)**

Module-5

9 a. Explain the following with sketches.
i) Perfect Frame ii) Deficient frame iii) Redundant frame. **(06 Marks)**

b. For the Truss shown in Fig.Q9(b), determine the reactions at the support. **(07 Marks)**

c. Determine the weight of Truss (Dead load) for the detail shown in Fig Q9(b). Size of Angle used is Double Angle ISA 50×50×6 @ 4.5kg/mt for each angle. **(07 Marks)**

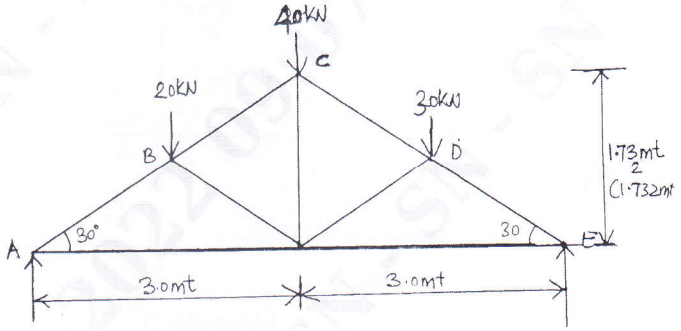

Fig Q9(b)

OR

OR

10 Explain the procedure adopted to analyse the Truss by

a. Method of joints

b. Method of section. **(20 Marks)**

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