CBCS SCHEME

USN | | | | | | | | | |

15ARC/ENG15

First Semester B.Arch. Degree Examination, Dec.2023/Jan.2024
Building Structures - I

Time: 3 hrs.

Max. Marks:100

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

MODULE - 1

1 a. Explain Lateral resistance system with relevant sketches. **(10 Marks)**
   b. Explain one way and two way system with reference to Yield line theory. **(10 Marks)**

OR

2 a. Explain Force system in Arch , Dome and Truss with sketch. **(10 Marks)**
   b. Explain structure as a device for channeling loads. **(10 Marks)**

MODULE - 2

3 Explain the following with examples :
   a. Dead load. **(07 Marks)**
   b. Imposed load. **(07 Marks)**
   c. Thermal load. **(06 Marks)**

OR

4 Explain the following with examples :
   a. Static load. **(07 Marks)**
   b. Dynamic load. **(07 Marks)**
   c. Impact load. **(06 Marks)**

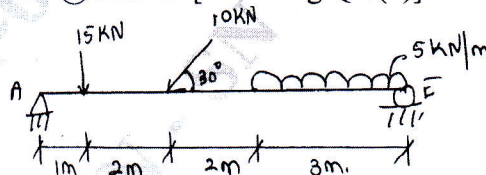## MODULE - 3

5 a. Explain the principle of transmissibility of forces with an example. **(10 Marks)**
   b. Explain equation of Equilibrium. **(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. 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 $E = 2 \times 10^5 \, N/mm^2$, 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 the concept of Triangulation in Truss.   (10 Marks)
   b. Explain the different methods used to analyse the Truss.   (10 Marks)

OR

10 a. What are the assumptions made in the analysis of Truss? Explain the classification of
      Trusses with example for each.   (12 Marks)
   b. Calculate the weight of the Truss shown in the fig. Q10(b), if the members are ISA
      $45 \times 45 \times 6$mm and 4.0kg/m.   (08 Marks)

Fig. Q10(b)

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