CBCS SCHEME

USN | | | | | | | | | | **15ARC/ENG15**

First Semester B.Arch. Degree Examination, Feb./Mar. 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. *Follow written Dimension, do not scale the drawing.*

Module-1

1   "Evolution of structures" explain from the primitive to modern times, How the changes took place in structural engineering.   **(20 Marks)**

OR

2   a.   What are important properties of cement and steel?   **(08 Marks)**
     b.   What are advantages of concrete?   **(05 Marks)**
     c.   What is Reinforced cement concrete?   **(04 Marks)**
     d.   What are the tests conducted on Fresh concrete?   **(03 Marks)**

Module-2

3   a.   With neat sketch, briefly explain with examples: Manmade cantilever and Natural cantilever.   **(08 Marks)**
     b.   Manmade framed structure consists of RCC slab, RCC Beams and RCC columns and foundation. Show the load path and how the load is transferred.   **(12 Marks)**

OR

4   a.   Explain the following with example :
          (i) Live load   (ii) Dead load   (iii) Impact load   (iv) Earth quake load.   **(10 Marks)**
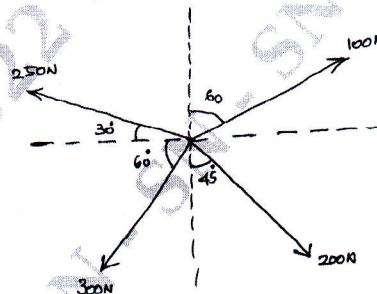   b.   Determine the magnitude and direction of resultant of forces shown in Fig Q4(b).

Fig Q4(b)   **(10 Marks)**

Module-3

5   a.   What are statically determinate and statically indeterminate beams? Explain with examples.   **(08 Marks)**
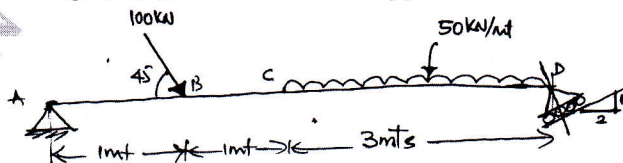   b.   For the beam shown in Fig Q5(b), determine the support reactions.

Fig Q5(b)   **(12 Marks)**

OR

6   a.   With help of neat sketch, explain different types of supports.   **(08 Marks)**

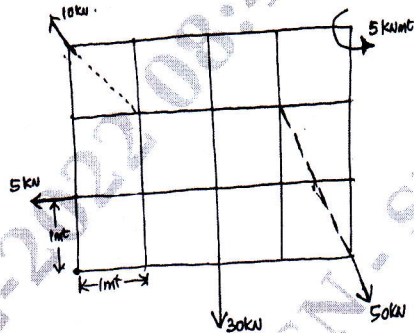   b.   Determine the magnitude, direction and position of the Resultant of forces shown in Fig Q6(b).

Fig Q6(b)   **(12 Marks)**

Module-4

7   a.   Define the following :

           i) Modulus of elasticity   ii) Poisson's Ratio   iii) Thermal stresses and strains   **(07 Marks)**

       b.   A steel specimen of 12.5mm diameter and 150mm gauge length is subjected to Tensile test. It is observed that load at yield point is 43kN and maximum load is 60kN. A load of 16.4kN is required to cause an elastic extension of 0.1mm. Final length of the specimen is 190mm and the diameter at neck after the fracture is 8mm. Determine the yield stress, ultimate stress, Young's modulus % increase in length and % Reduction in area.   **(13 Marks)**

OR

8   a.   Explain the different types of stresses encountered in structures.   **(10 Marks)**

       b.   A bar shown in Fig Q8(b) is subjected to axial load of 50kN, the total extension of the bar is 0.285mm. Determine the modulus of elasticity of material.
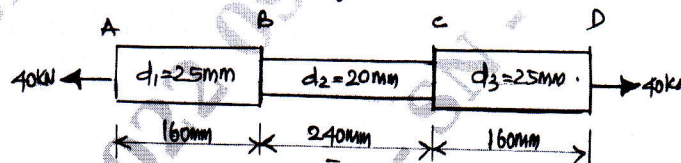

Fig Q8(b)   **(10 Marks)**

Module-5

9   a.   Explain with neat sketches, i) Perfect frame   ii) Deficient frame   iii) Redundant frame.   **(09 Marks)**

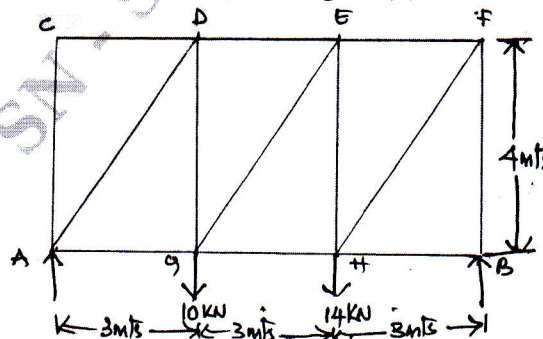   b.   Determine the support reactors for the frame in Fig Q9(b)

Fig Q9(b)   **(06 Marks)**

c. What are Assumptions made in the analysis of frame? **(05 Marks)**

OR

10 a. Analyse the truss shown in Fig Q10(a) by "Method of Joints" Indicate the nature of force on the truss.
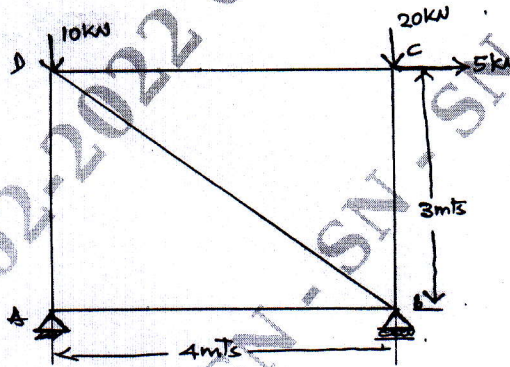

Fig Q10(a) **(13 Marks)**

b. Explain briefly procedure adopted to analyse by method of sections. **(07 Marks)**

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