CBCS SCHEME

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21ENG26

# Second Semester B.Arch. Degree Examination, Dec.2025/Jan.2026
## 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. Calculate the dead load of R.C.C. slab of size
Width = 5 m ; Length = 6 m ; Thickness = 150 mm. **(08 Marks)**

b. Describe the laboratory tests for the below materials:
i) Tensile strength of steel ii) Workability of concrete **(12 Marks)**

**OR**

2 a. Write important properties and uses of the following building materials:
i) Steel ii) Aluminium iii) Glass **(08 Marks)**

b. Explain the following tests with example:
i) Dead load iii) Imposed load iii) Snow load iv) Earthquake load **(12 Marks)**

### Module-2

3 a. Briefly explain the classification of Force System. **(10 Marks)**

b. Calculate the resultant of the force system shown in Fig.Q3(b).

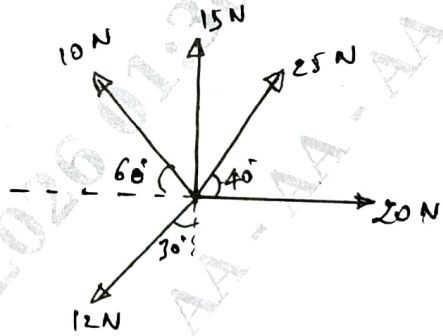


Fig.Q3(b) **(10 Marks)**

**OR**

4 a. Differentiate between :
i) Rigid body and Deformable body
ii) Resolution of forces and Composition of forces **(04 Marks)**

b. Write short notes on :
i) Principles of Transmissibility
ii) Moment of Force
iii) Free Body Diagrams
iv) Resultant of Force **(16 Marks)**

## Module-3

5 a. Explain different types of loading for a beam with neat examples. **(08 Marks)**

b. A simply supported beam of length 10 m, carries UDL and 2 point load as shown in Fig.Q5(b). Calculate the $R_A$ and $R_B$.

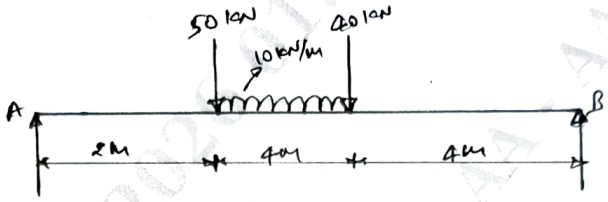


Fig.Q5(b) **(12 Marks)**

**OR**

6 a. State and explain equilibrium of coplanar concurrent and coplanar non-concurrent force system. **(08 Marks)**

b. Four coplanar forces equal to 2 KN , 3 KN, 5 KN and 7 KN are acting on a square body having its side as 1 m. Determine magnitude, direction and position of a simple resultant force from point 'A' as shown in Fig.Q6(b).

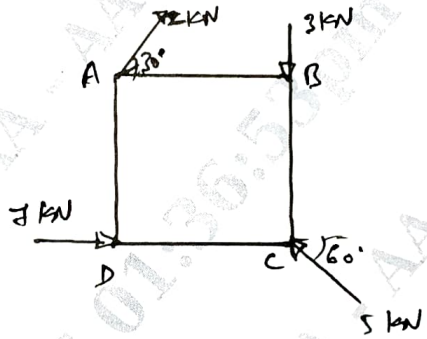


Fig.Q6(b) **(12 Marks)**

## Module-4

7 a. Briefly explain Parallel Axis Theorem, Perpendicular Axis Theorem and Radius of Gyration. **(05 Marks)**

b. Find the centroid of the Fig.Q7(b).

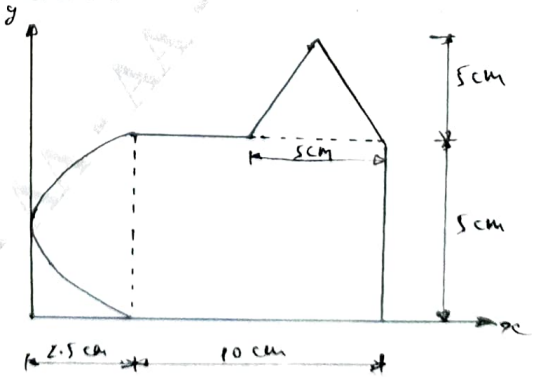


Fig.Q7(b) **(15 Marks)**

**OR**

8 a. Determine the centroid for the Fig.Q8(a).

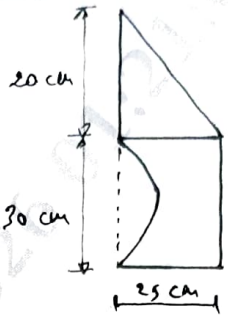


Fig.Q8(a) **(10 Marks)**

b. Calculate the M.I for asymmetrical I-section where
(i) Top- flange = 160 mm × 12 mm
(ii) Bottom flange = 240 mm × 12 mm
(iii) Web = 200 mm × 10 mm
Find $I_{xx}$ and $I_{yy}$. **(10 Marks)**

## Module-5

9 a. What are the assumptions made in the analysis of Trusses? **(10 Marks)**

b. Analyze the truss shown in below Fig.Q9(b).

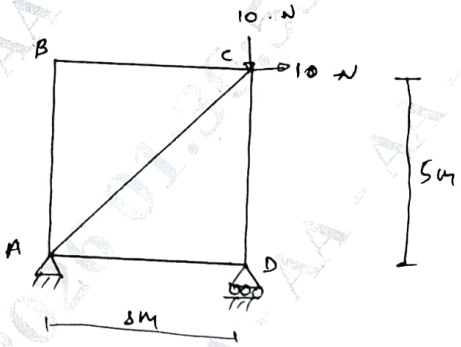


Fig.Q9(b) **(10 Marks)**

**OR**

10 Find the force in all the members shown in Fig.Q10.

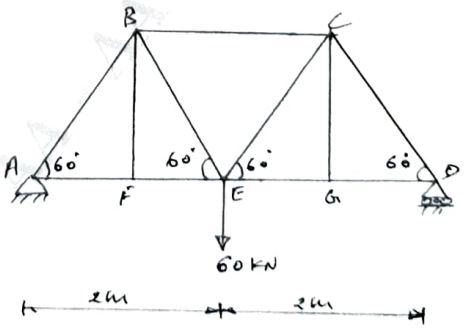


Fig.Q10 **(20 Marks)**

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