CBCS SCHEME - Summer Semester

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

21ENG26

Second Semester B.Arch. Degree Examination, June/July 2026
Building Structure – I

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is plain cement concrete? What are the advantages and disadvantages of concrete and steel? **(10 Marks)**

b. What is Durability of concrete? What are the factors that affect the durability of concrete? **(10 Marks)**

OR

2 a. Write important properties of Wood, Aluminium and Glass. **(12 Marks)**

b. Explain the following terms with example:
(i) Dead load (ii) Live load (iii) Impact load (iv) Earthquake load. **(08 Marks)**

Module-2

3 a. Explain :
i) Force and classification of force system
ii) Parallelogram law of forces. **(10 Marks)**

b. Determine the magnitude and direction of the resultant force, for the coplanar concurrent force system shown in Fig.Q3(b).

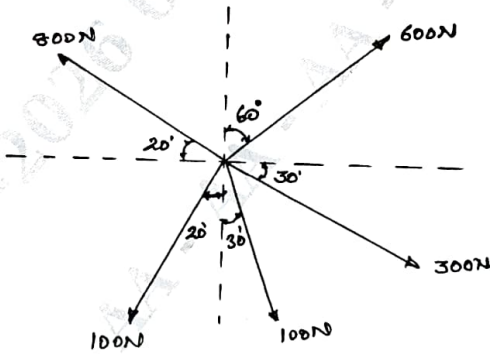

Fig.Q3(b) **(10 Marks)**

OR

4 a. Explain the characteristics of a force. **(05 Marks)**

b. Explain the principle of transmissibility. **(05 Marks)**

c. For the coplanar current force system shown in Fig.Q4(c). The magnitude and direction of the resultant force is 500kN and is acting along x – axis. Determine the unknown force P.

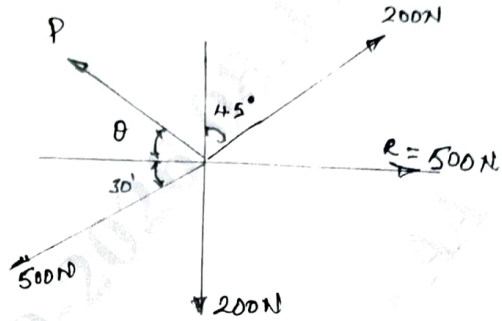

Fig.Q4(c)

(10 Marks)

Module-3

5 a. Define couple. What are the characteristics of a couple? **(05 Marks)**

b. State and prove "Varignon's Theorem". **(05 Marks)**

c. Determine the magnitude, direction and position of the resultant force from point 'A'. Refer Fig.Q5(c).

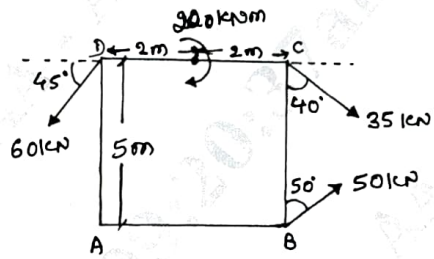

Fig.Q5(c)

(10 Marks)

OR

6 a. With neat sketches, explain the different types of supports and loads. **(10 Marks)**

b. Determine the support reactions for the beam shown in Fig.Q6(b).

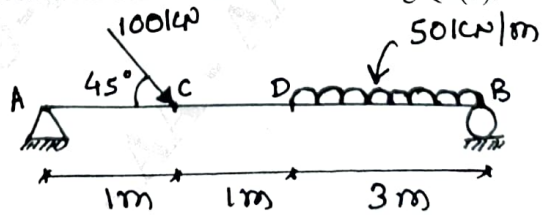

Fig.Q6(b)

(10 Marks)

Module-4

7 a. Explain the following terms with sketches:
i) Centre of gravity
ii) Centroid
iii) Radius of gyration
iv) Parallel axis theorem **(10 Marks)**

b. Locate the centroid of an area shown in Fig.Q7(b) with respect to OX and OY. All dimensions are in mm.

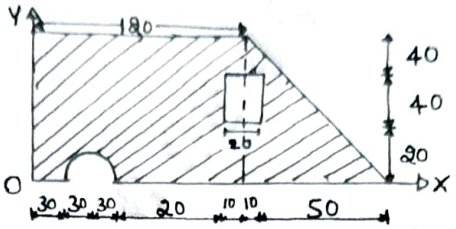

Fig.Q7(b) **(10 Marks)**

OR

8 a. Determine the radius of gyration about the centroidal axes for the Lamina shown in Fig.Q8(a). All dimensions are in mm.

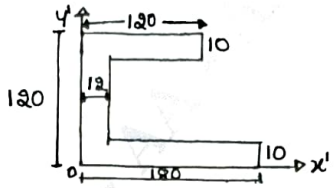

Fig.Q8(a) **(10 Marks)**

b. Determine the second moment of area about horizontal centroidal axis for shaded area shown in Fig.Q8(b). Also find the radius of gyration about the same axis. Take $R_1 = 50$mm and $R_2 = 20$mm.

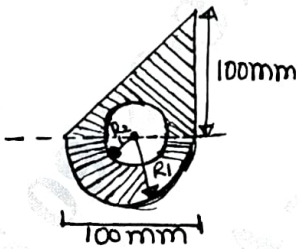

Fig.Q8(b) **(10 Marks)**

Module-5

9 Briefly explain the methods used for the analysis of truss. **(20 Marks)**

OR

10 Analyse the truss shown in Fig.Q10 by method of joints.

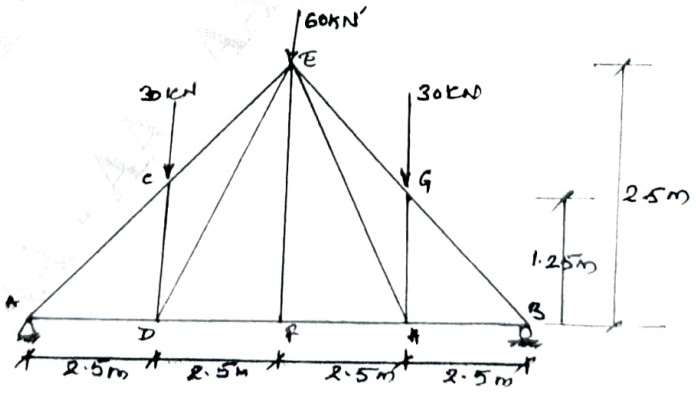

Fig.Q10 **(20 Marks)**