Five Year Second Semester B. Arch. (CGS) Examination

ARCHITECTURE OF STRUCTURE – I

Paper – 02 AR 05

(USC – 10014)

P. Pages : 5

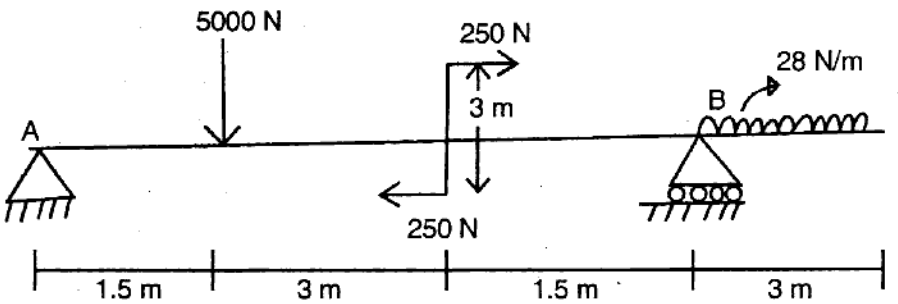
Time : Three Hours] [Max. Marks : 80

Note : (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
(2) All questions carry equal marks.
(3) Answer **Three** questions from Section A and **Three** questions from Section B.
(4) Due credit will be given to neatness and adequate dimensions.
(5) Assume suitable data wherever necessary.
(6) Illustrate your answer wherever necessary with the help of neat sketches.
(7) Use pen of Blue / Black ink / refill only for writing the answer book.

SECTION A

1. (a) Define : Force
Also discuss the different types of force systems with neat sketches. 6

(b) Determine the Support Reactions at A and B for the beam shown in Fig.



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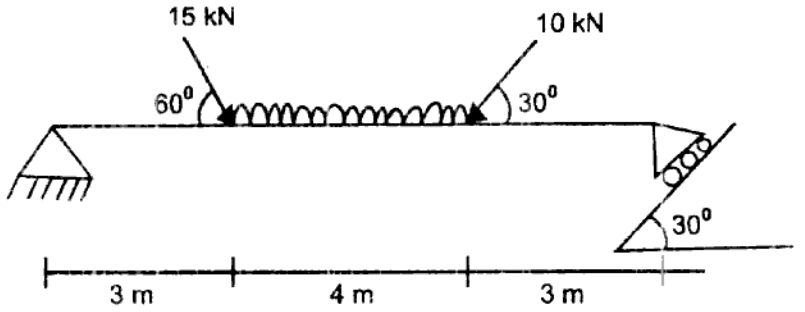
OR

2. (a) Define Moment of a Force. 4

(b) Determine the Support Reactions at A and B for the beam shown in Fig.



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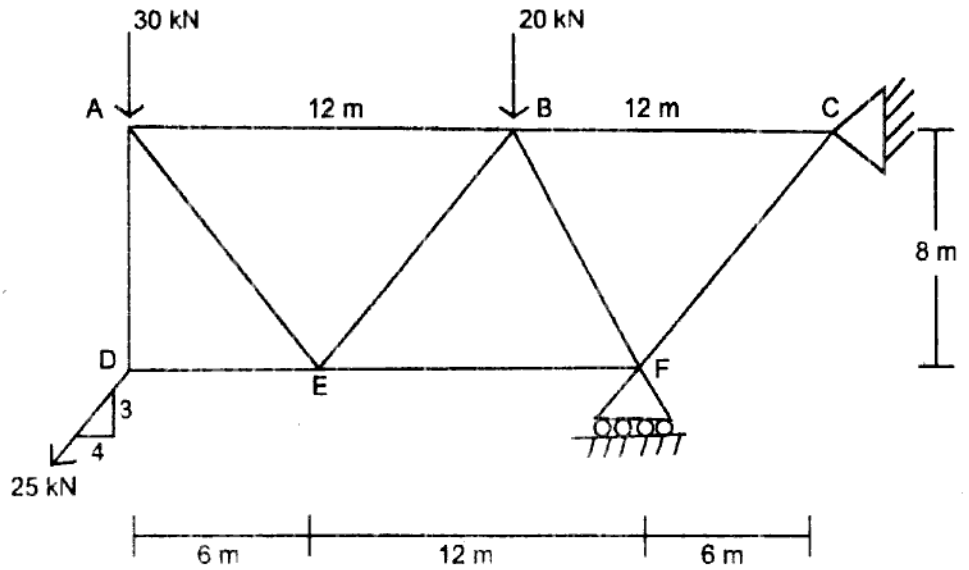
3. Determine the magnitude and nature of the force in each member of truss.



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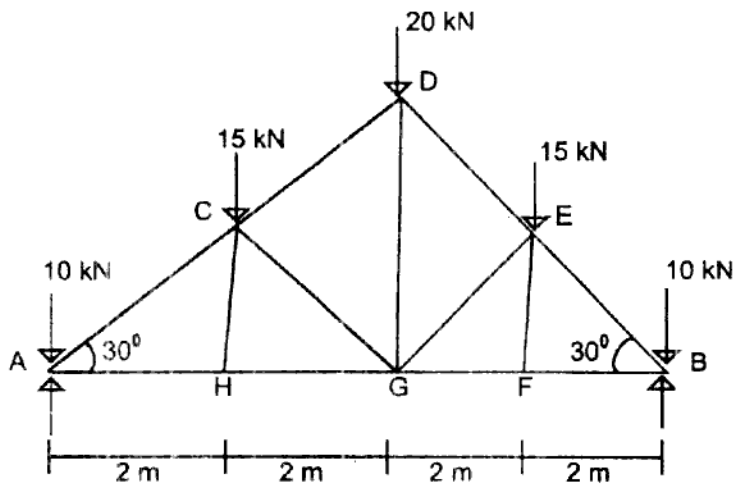
OR

4. Determine the forces in the members of truss by graphical method.



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5. (a) Define :

(i) Elasticity.

(ii) Elastic Limit.

(iii) Hook's Law. 6

(b) Find the Young's Modulus of a brass rod of diameter 25 mm and of length 250 mm which is subjected to a tensile load of 50 kN. when the extension in the rod is equal to 0·3 mm. 7

OR

6. (a) Define :

(i) Shear Stress.

(ii) Shear Strain. 4

(b) A rod of 150 cm length and 2 cm in diameter is subjected to an axial pull of 20 kN. If the modulus of Elasticity of material is $2{\cdot}1 \times 10^5$ N/mm^2.

Determine :

(i) Stress.

(ii) Strain.

(iii) Elongation in rod. 9

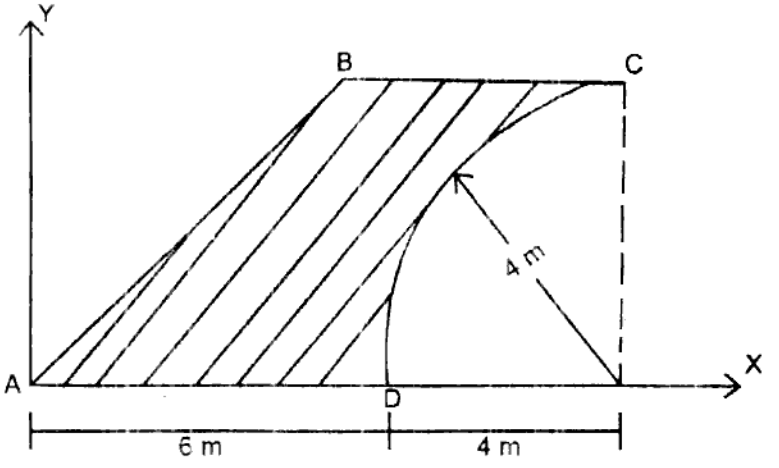
SECTION B

7. A simply supported beam of length 6 m. carries point load of 3 kN and 6 kN at a distance of 2 m and 4 m from the left end. Draw shear force and Bending Moment diagrams for the beam. 13

OR

8. Draw the SFD and BMD for a simply supported beam of length 9 m and carrying UDL of 10 kN/mt for a distance of 6 m from the left end. 13

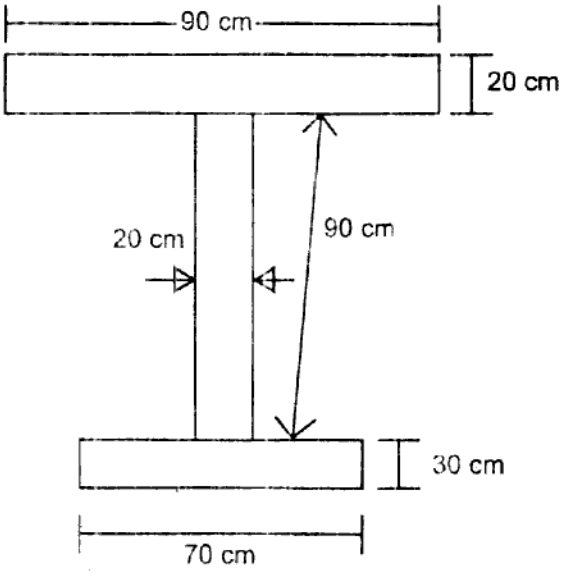
9. Calculate MI about Centrodial Axis for the hatched Area ABCD shown in Fig.



14

OR

10. Calculate the MI about Centrodial Axis of Unsymmetrical I – Section shown in Fig.



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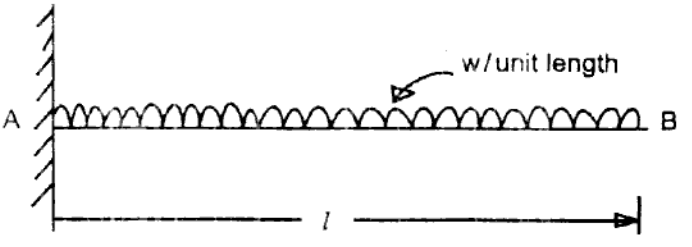
11. Derive the expression for the maximum deflection for Fig. shown below.



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OR

12. (a) A beam is simply supported and carries a UDL of 40 kN/mt run over the whole span. The section of the beam is rectangular having depth as 500 mm. If the max. stress in the material of the beam is 120 N/mm^2 and MI of the section is 7×10^8 mm^4. Find the span of the beam. 9

(b) Write Assumptions made in the theory of pure bending. 4