

4. A bar is made by Rigidly connecting three bars of different material and different diameters. Find the stress at different sections of bars and its total elongation when it is subjected to a tensile load of 20 kN. Take $E_S = 200$ GPa, $E_B = 100$ GPa and $E_A = 70$ GPa.
Fig. (5) 10

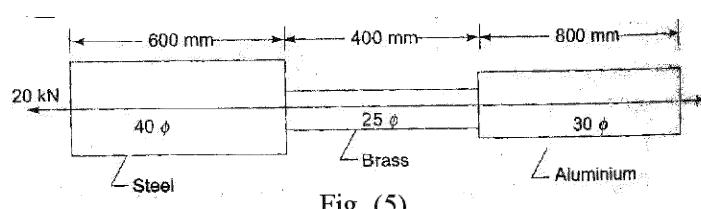


Fig. (5)

Unit III

5. Draw Bending moment and shear force diagram for the following beam. Also indicate point of contrafactual and point of max. bending moment. Fig. (6) : 10

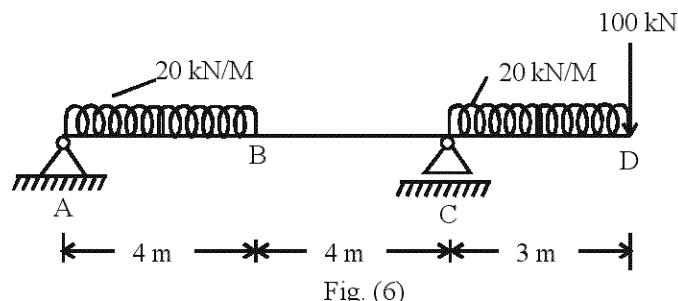


Fig. (6)

A-4002

B. Arch. EXAMINATION, Dec. 2017

(First Semester)

(B. Scheme) (Main & Re-appear)

(Arch.)

AR-105-B

STRUCTURAL DESIGN-I

Time : 3 Hours]

[Maximum Marks : 50

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks. Assume suitable data if not provided.

Unit I

1. (a) Draw free-body diagram of AB, CE and DE Fig. (1).

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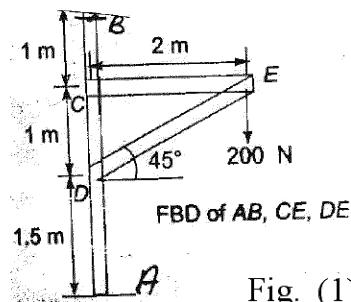


Fig. (1)

- (b) Explain with example Newton's second law of motion.
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2. (a) Find resultant of force system Fig. (2) at point O.
- 5

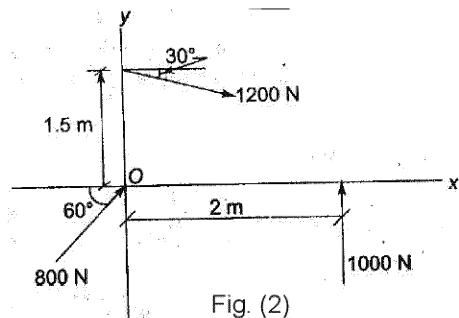


Fig. (2)

- (b) Find Reactions at A and B for the structure loaded as shown in Fig. (3) : 5

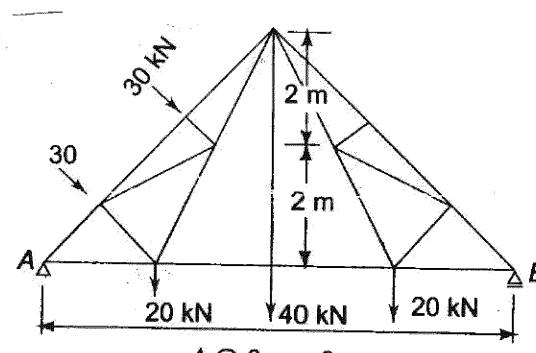


Fig. (3)

- ## Unit II
3. Find the forces in the various members of the Truss Fig. (4) : 10

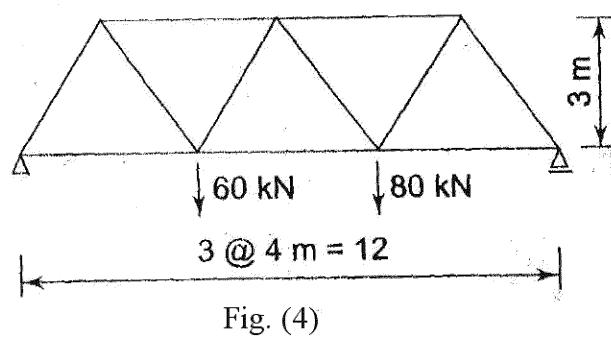


Fig. (4)

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P.T.O.

8. Find centroid of the following Fig. (9).

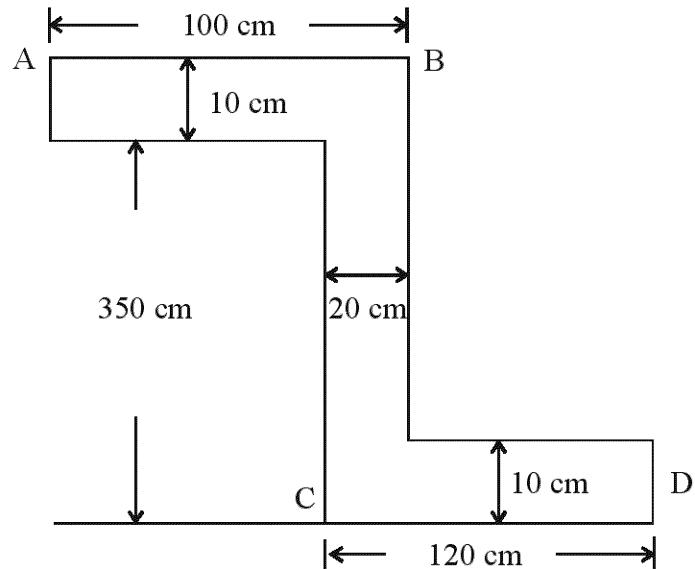


Fig. (9)

6. Find the deflection at point C of cantilever beam. Take EI constant. Fig. (7). **10**

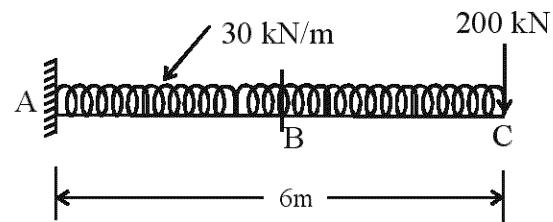


Fig. (7)

7. Drive values of Moment of Inertia of a Triangle with base b and height h about centroidal X-X and Y-Y axis. Fig. (8). **10**

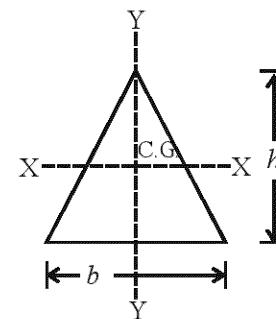


Fig. (8)