53 (CE 402) STAN-I

2019

STRUCTURAL ANALYSIS–I

Paper : CE 402

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer ***any five*** *questions.*

1. Derive the equation : 20

(a) Bending Moment = $EI \frac{d^2y}{du^2}$

(b) Sheer Force = $EI \frac{d^3y}{dx^3}$

where I = Moment of Inertia, E = Modulus of Elasticity.

2. Derive rotation at $A(\theta_A)$ and $B(\theta_B)$ by using Macaulay's Method of *Fig.* 1. 20

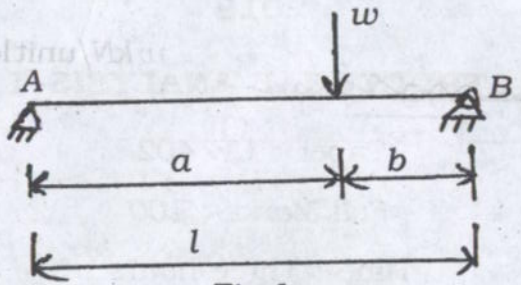

Fig. 1

3. Determine the vertical deflection at *A* and *C* in the *Fig.* 2. Take $E = 200 GPA$ and $I = 150 \times 10^4 mm^4$. 20

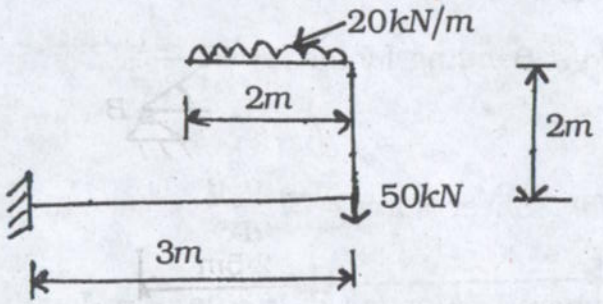

Fig. 2

4. Determine the slope at *A* and deflection at *E* as shown in *Fig.* 3 by using moment area method or conjugate beam method. 20

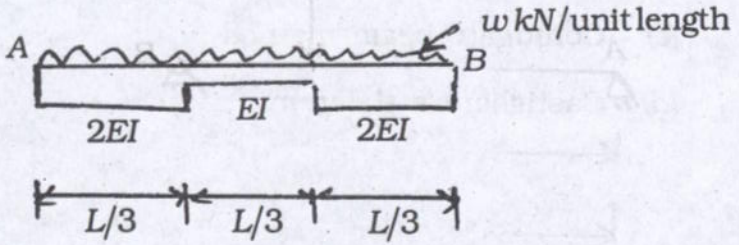

Fig. 3

5. Find the member forces and reactions of the truss shown in the *Fig.* 4. 20

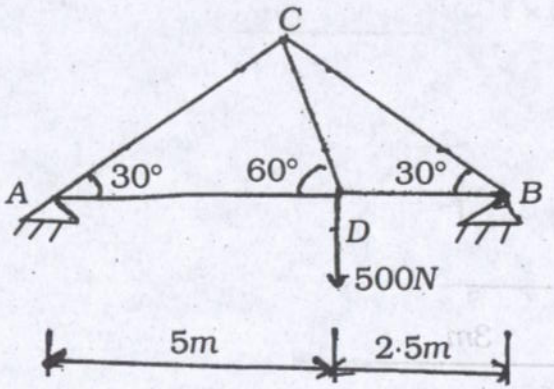

Fig. 4

6. Write short notes on : 4×5=20

(a) Determinate and indeterminate

(b) Different types of support conditions

(c) Conjugate beam method

(d) Castigliano's theorem.