Total number of printed pages–4

53 (CE 402) STAN–I

2018

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. Write short notes on : 4×5=20

   (a) Different types of support conditions

   (b) Castigliano's Theorems

   (c) Moment area method

   (d) Conjugate beam method.

Contd.

2. Draw shear force and bending moment diagram of *Fig.1*. 20

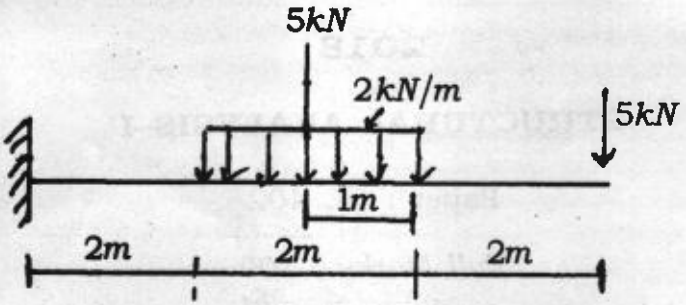

Fig.1

3. A simply supported beam of span 12 is shown in *Fig.2*. Determine the vertical deflection at *D* and rotation at *E*. Take $EI = 20000 kNm^2$. 20

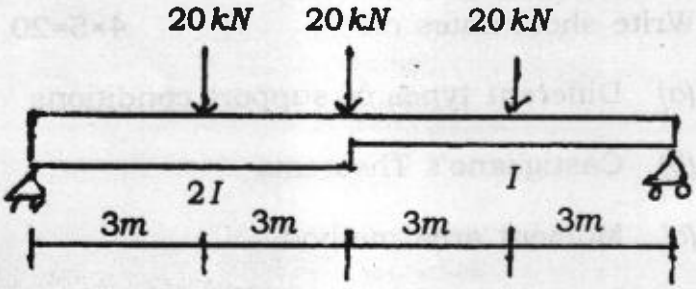

Fig.2

4. Determine the forces in all the members of truss as shown in *Fig.3*. 20

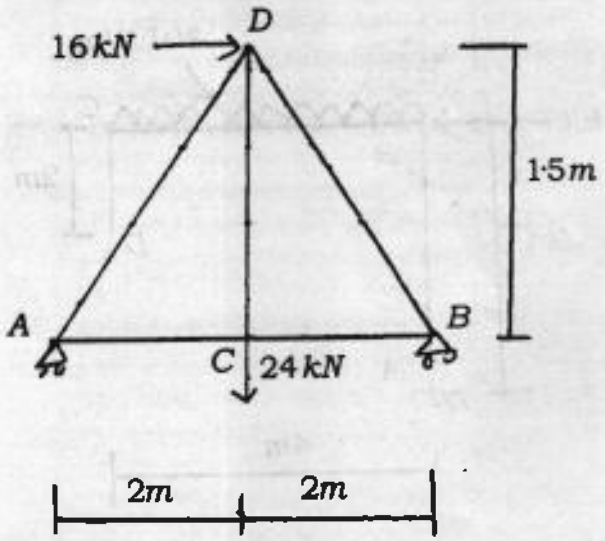

Fig.3

5. A three hinged circular arch has a span of $36m$ and a rise of $6m$. Determine the bending moment, normal thrust and radial shear of $9m$ from the left support, if the arch is subjected to a uniformly distributed load of $30kN/m$ over left portion and a concentrated load of $60kN$ at $15m$ from the left springing. 20

6. Determine the vertical and horizontal displacement at D in the frame shown in *Fig.4*. Take $EI = 12 \times 10^{13} Nmm^2$. 20

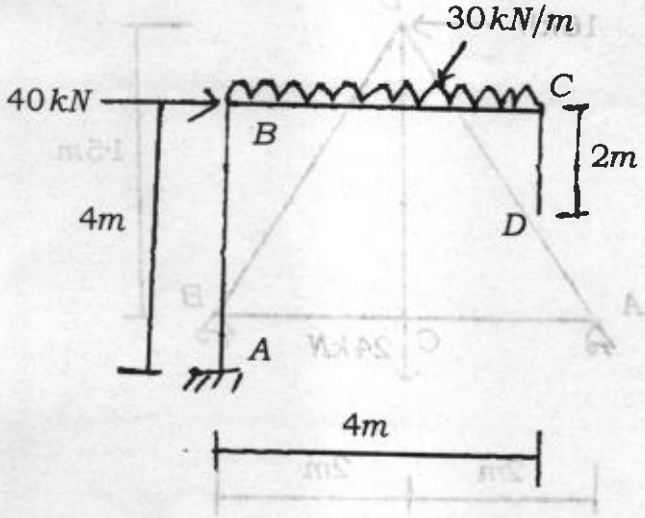

Fig.4