

2018

STRUCTURE-IV

Paper : ENG-4-5

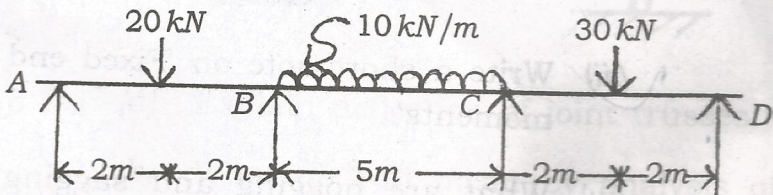
Full Marks : 100

Time : Three hours

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

Answer **any five** questions.

1. Derive Clapeyron's theorem of three moment equation. 20
2. (a) Write a short note on moment distribution method.
(b) Analyse the continuous beam as shown by the method of moment distribution. Draw the shear force diagram.



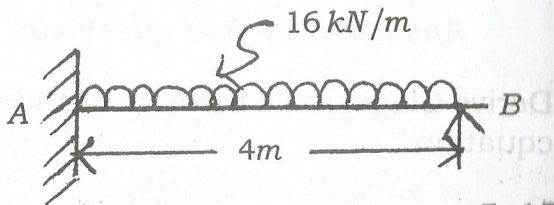
5+15=20

Contd.

3. (a) What are Propped Cantilevers ? Explain.

(b) A cantilever 4m long and propped at the free end carries U.D.L. at the rate of 16kN/m run. Calculate the maximum bending moment value and draw the bending moment diagram.

Take $E = 2 \times 10^4 \text{ kN/cm}^2$ and $I = 28000 \text{ cm}^4$.



5+15=20

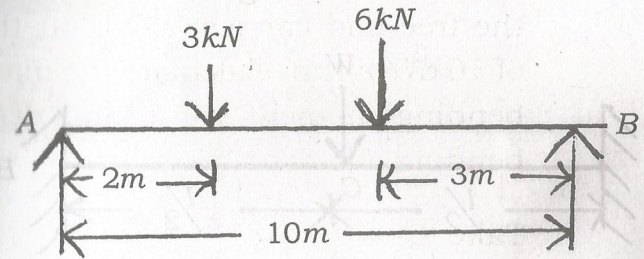
4. (a) (i) What is flexural rigidity ? 2

(ii) What is the relation between bending moment and shear force ? 1

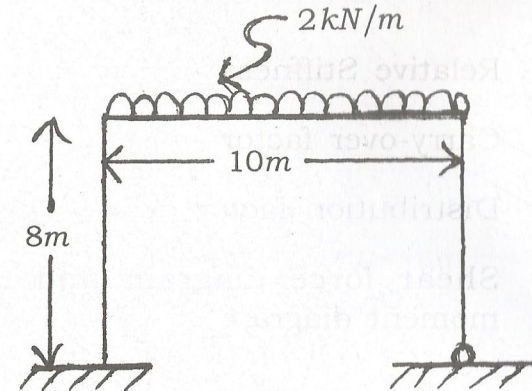
(iii) Write a short note on 'Fixed end moments'. 5

(iv) What are hogging and sagging moments ? 2

(b) Analyse the simply supported beam given below. Draw the shear force diagram and bending moment diagram. 10



5. Analyse the portal frame as shown below and sketch the S.F.D. and B.M.Ds. 20

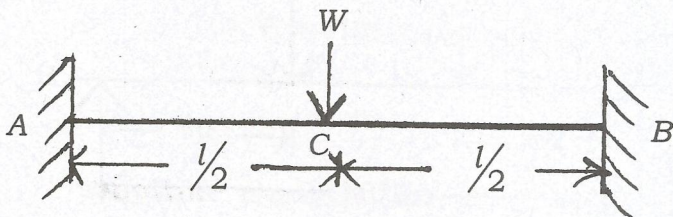


6. (a) Explain deflection of joint trusses. 5

(b) What do you mean by analysis of a structure ? 2

(c) Mention few advantages of a fixed beam. 3

(d) Find the fixed end moment and plot the shear force diagram. 10



7. Write short notes on the following :

$5 \times 4 = 20$

(a) Relative Stiffness

(b) Carry-over factor

(c) Distribution factor

(d) Shear force diagram and Bending moment diagram.