2014

STRUCTURE-IV

Paper : ENG–4·5

Full Marks : 100

Pass Marks : 40

Time : Three hours

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

*Answer **any five** questions.*

1. (a) What is a propped cantilever ? Where it
is used ? Show with a diagram.   5

    (b) Find out the support reactious and plot
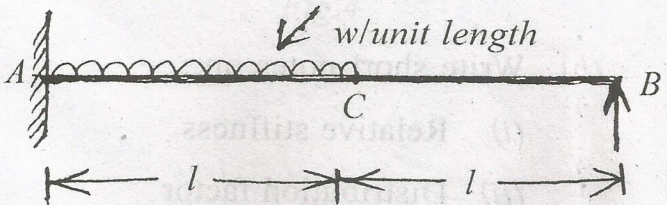the bending moment diagram for the
propped cantilever shown in *Fig.*1

Fig.1   15

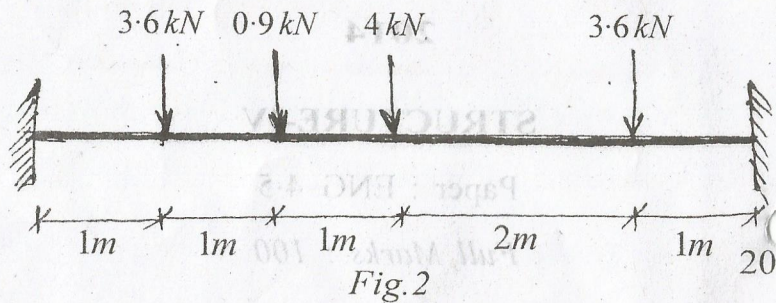2. Draw the bending moment diagram and the shear force diagram for the *Fig. 2*

3.6 kN   0.9 kN   4 kN   3.6 kN

1m   1m   1m   2m   1m   20

Fig. 2

3. Find the fixed and moments for the beam carrying a uniformly varying load as shown in *Fig. 3*.

w/unit length

l

Fig. 3   20
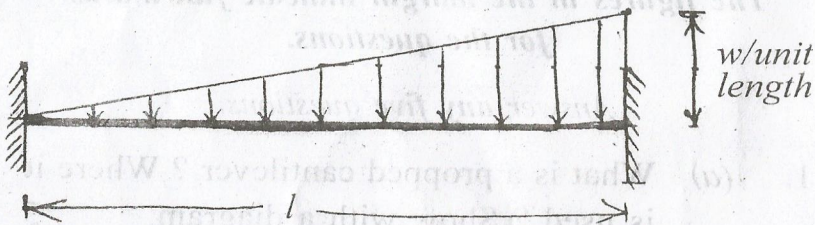
4. (a) State and prove the Clapeyron's theorem of three moments for continuous beam.
                                                      10

   (b) Write short notes on :

       (i) Relative stiffness

       (ii) Distribution factor   10

5. A continuous beam ABC covers two consecutive spans AB and BC of length 4*m* and 6*m* carrying uniformly distributed loads of 60 *kN/m* and 100 *kN/m* respectively. If the ends A and C are simply supported, find the support moments at A, B and C. Draw the shear force diagram and bending moment diagram using three moment theorem.   20

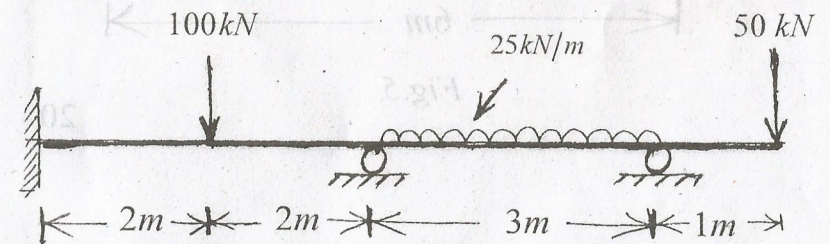6. Analyse the continuous beam as shown in *Fig. 4* using moment distribution method.

100 kN   25 kN/m   50 kN
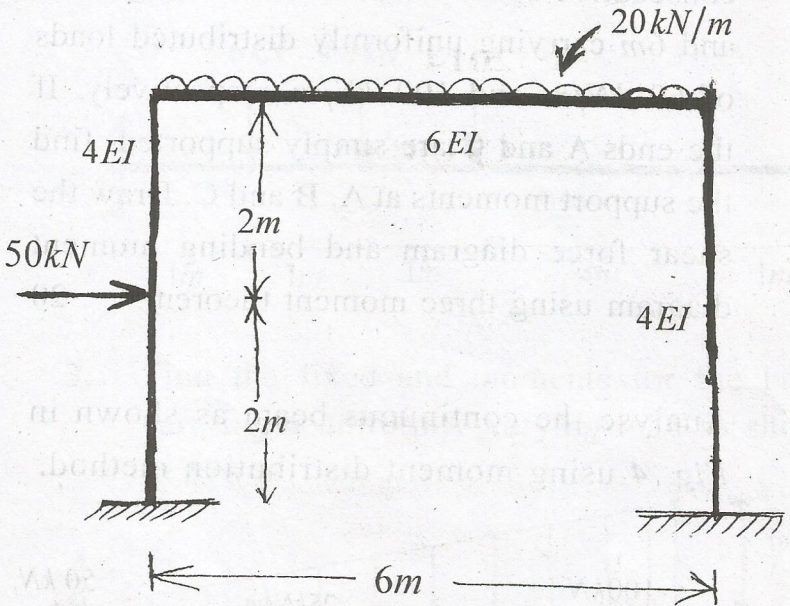
2m   2m   3m   1m

20

Fig. 4

7. Analyse the frame as shown in *Fig. 5.*

20 kN/m

4EI

6 EI

2m

50kN

2m

4EI

2m

|← —— 6m —— →|

Fig.5

20