Code: CE5T4

III B.Tech - I Semester – Regular Examinations - November 2015

STRUCTURAL ANALYSIS - II
(CIVIL ENGINEERING)

Duration: 3 hours   Max. Marks: 70

Answer any **FIVE** questions.   All questions carry equal marks

1 A parabolic arch hinged at the springings and crown has a span of 20 m. The central rise of the arch is 4 m. It is loaded with a uniformly distributed load of intensity 2 kN/m on the left 8 m length. Calculate
   a) the direction and magnitude of reaction at the hinges,

                                                                           6 M

   b) bending moment, normal thrust and shear at 5m from left end.   8 M

2 A two-hinged parabolic arch has a span 10 m and rise 1 m. It is subjected two concentrated loads of 60 kN at 3 m from the left hinge and 80 kN acts at its crown. Assume that $I = I_c$ Sec θ and Cos θ =1. Take area of cross section at the crown. $A_C = 0.18$ m^2 and E = 15×10^6 kN/m^2. Determine the reduction in the horizontal thrust in the arch due to rib shortening effect.   14 M

3 Analyze the frame shown in Fig: 1, by Cantilever method. Assume that all the columns have equal area of cross-section for the purpose of analysis.   14 M
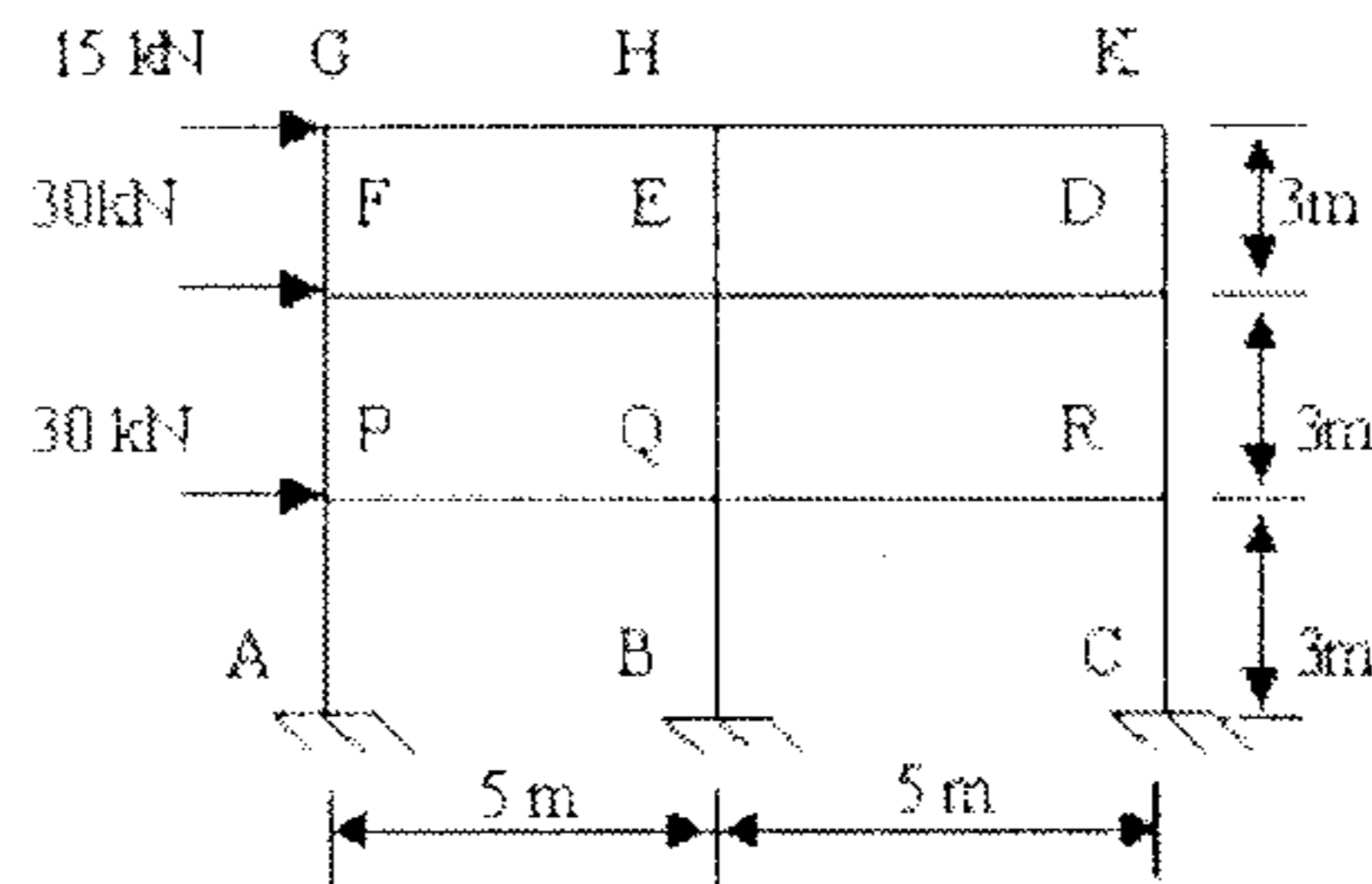
Fig: 1

4 The horizontal span of a cable is 100 m. The left support is at higher level than the right support by 10 m. The dip of the lowest point of the cable is 4 m below the right support and the cable is subjected to a load of 6 kN/ horizontal metre. Find the maximum pull in the cable and also find the length of the cable.   14 M

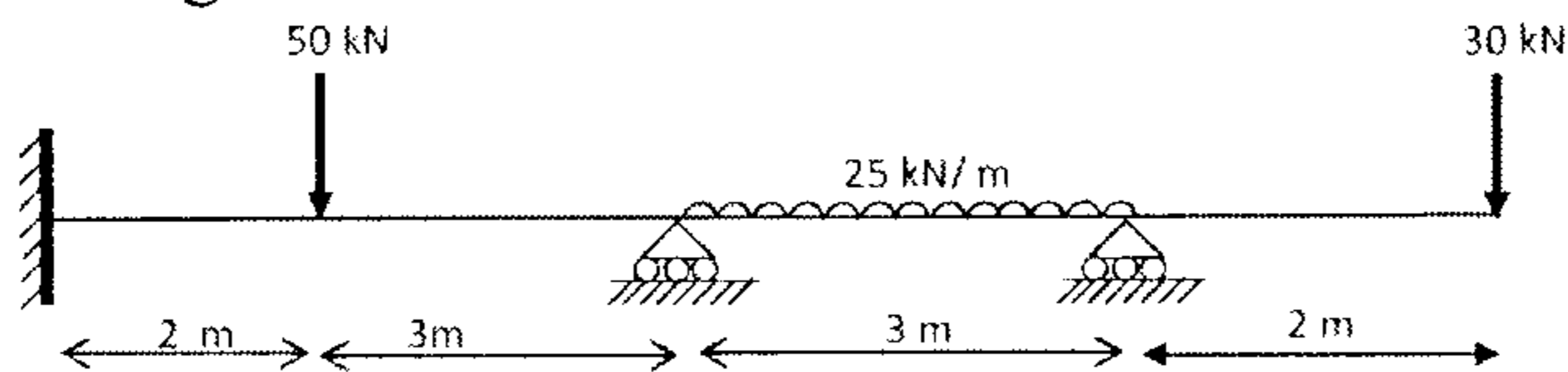5 Analyze the beam shown in the Fig: 2, by moment distribution method. Draw the shear force and bending moment diagrams.   14 M

Fig: 2

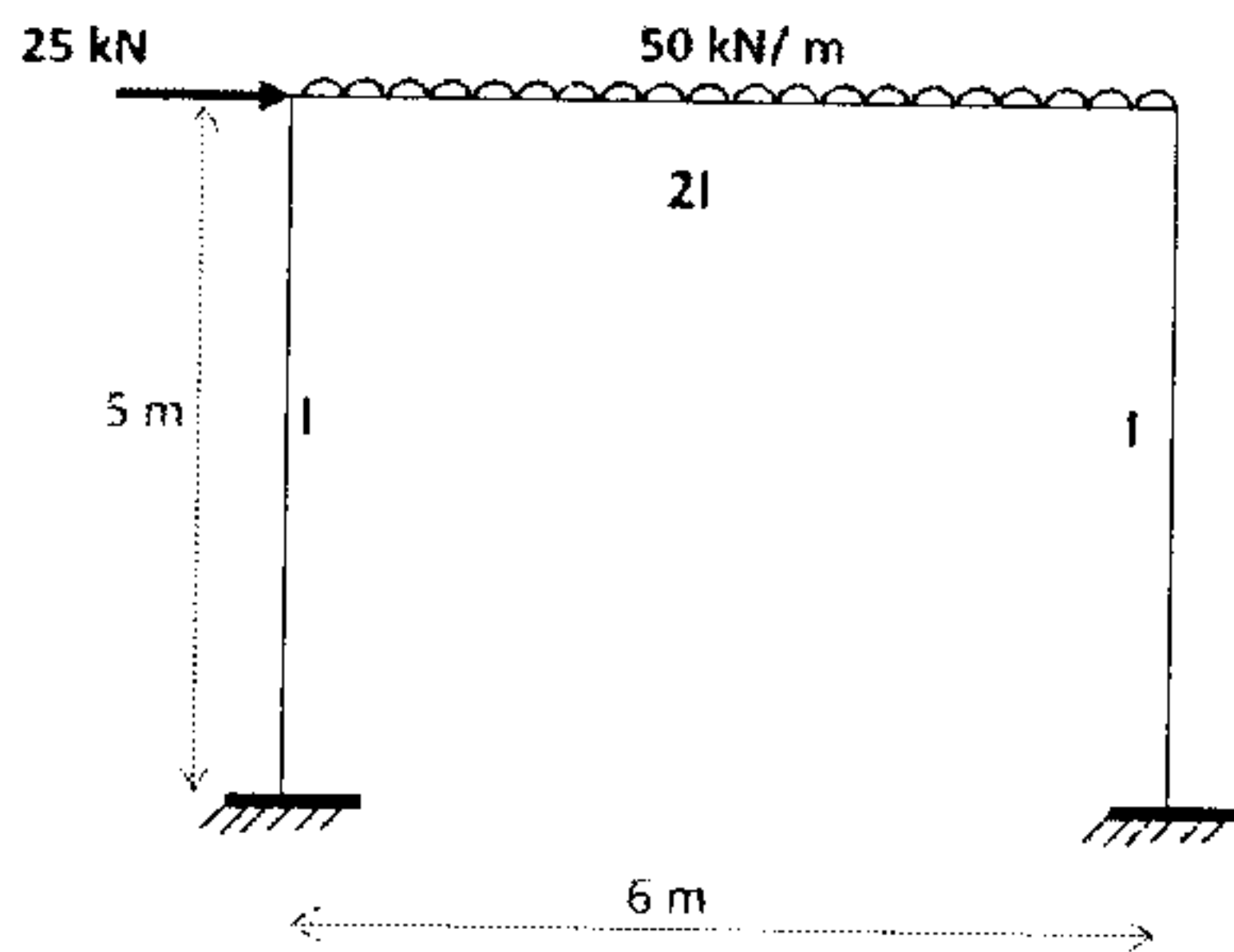6 Draw bending moment diagram of the portal frame shown in Fig: 3 by Kani's method .   14 M

25 kN   50 kN/ m

2I

5 m   I   I

6 m

Fig: 3

7 Analyze the continuous beam shown in Fig: 4 using Flexibility
Method.   14 M

75 kN

15 kN/ m   3 m

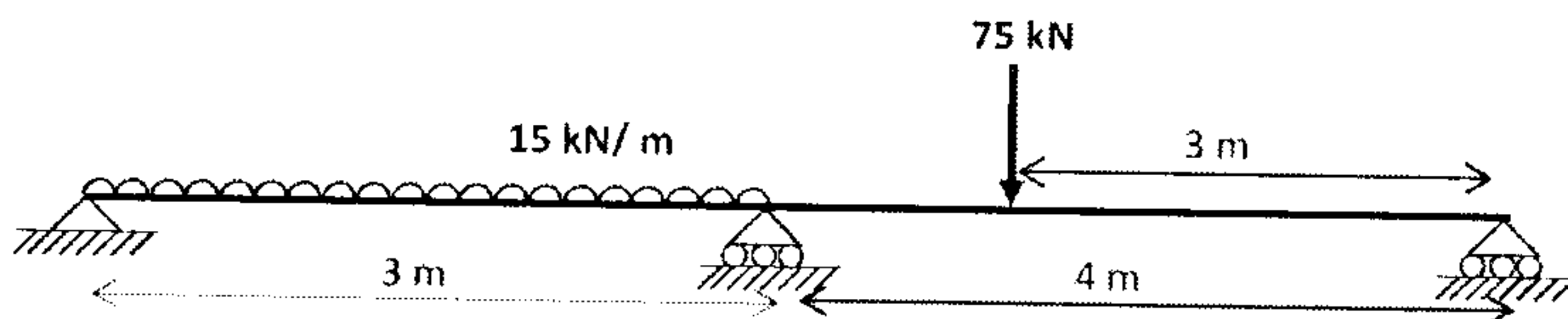3 m   4 m

Fig: 4

8 Draw bending moment diagram of the beam shown in Fig: 5
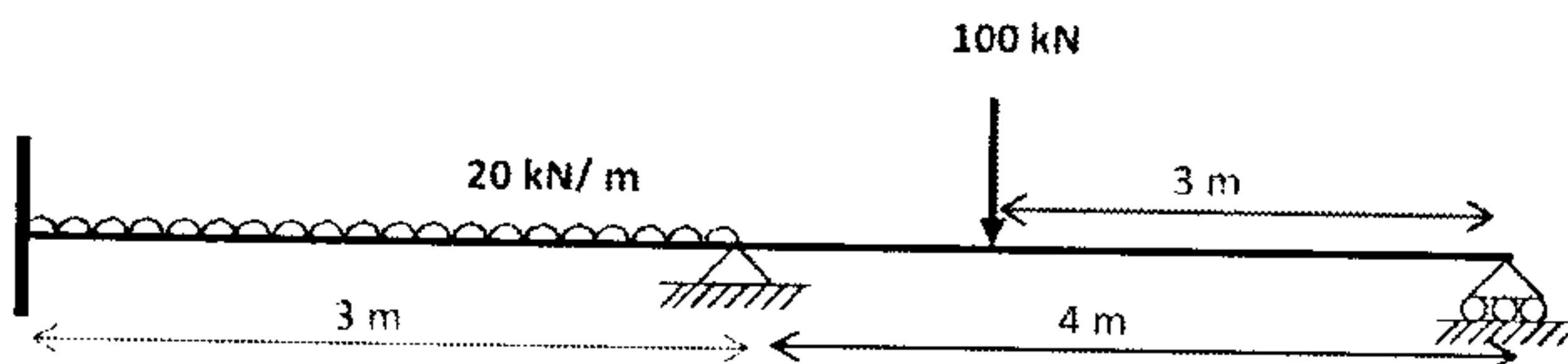using stiffness method   14 M

100 kN

20 kN/ m   3 m

3 m   4 m

Fig: 5