

THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY, PATIALA
DEPARTMENT OF CIVIL ENGINEERING
End Semester Examination- December 2006
CE-002 Structural Analysis B.E. 2nd Year (Civil)

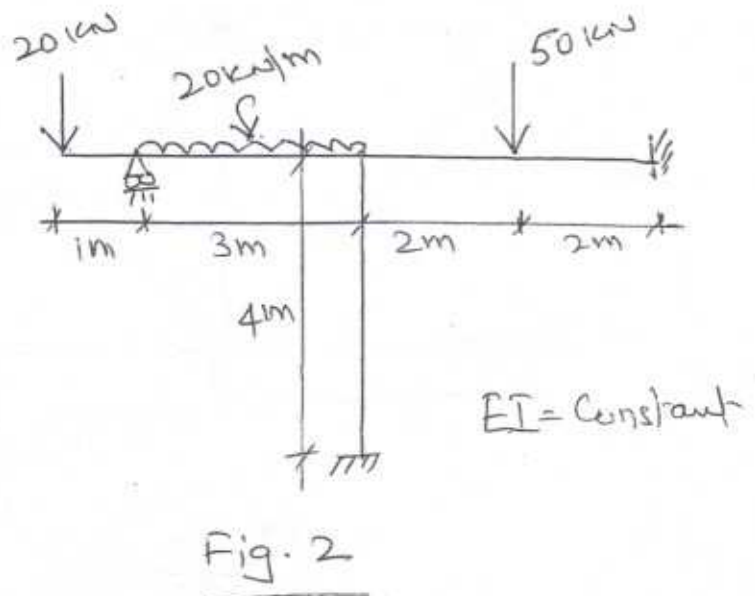
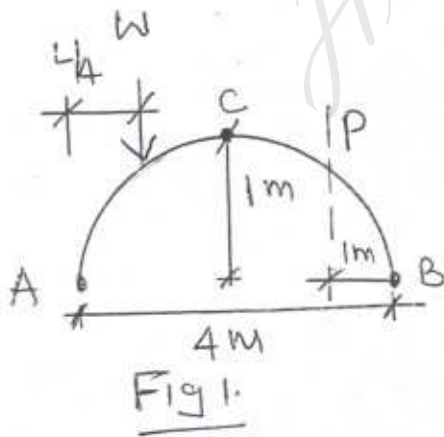
Max Marks: 36

Max Time : 3 Hrs

Note : Attempt any four questions

Assume missing data, if any suitably

- Q1 (a) Determine the internal forces at P in the three-hinged parabolic arch shown in fig 1. The internal hinge is placed at the mid-span point C. Also draw the bending moment diagram. (4)
- (b) Analyse the building frame shown in fig 3 using portal method of analysis and draw bending moment and shear force diagram. (5)
- Q2 A beam ABCD , 16m long is continuous over three span : AB=8m ; BC=4m ; CD=4m, the supports being at the same level . There is a uniformly distributed load of 40 kN/m over BC. On AB , is a point load of 80 kN at 2m from A and CD, there is a point load of 60 kN at 3m from D. Calculate the moments and reactions at the supports using three moment equation method. (9)
- Q3 Analyse the structure shown if fig. 2 by slope deflection method and sketch the bending moment and shear force diagrams. (9)
- Q4 Analyse the truss shown in fig 6. (9)
- Q5 A timber beam has a linear taper in depth from the ends to the centre of the span as shown in fig 4. Determine the displacement at the centre and rotation at the ends of the beam for the given loading. $E = 13 \times 10^6 \text{ kN/m}^2$. The beam is 200 mm wide throughout. (9)
- Q6 Draw ILD using Muller Breslau principle for support moment at A for the propped cantilever shown in fig 5. Compute IL ordinates at 1.5 m intervals. (9)



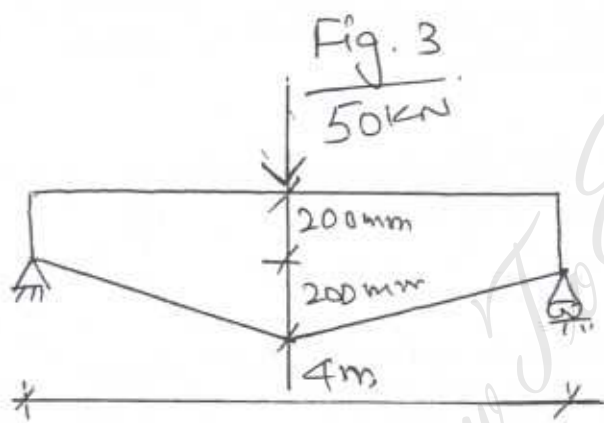
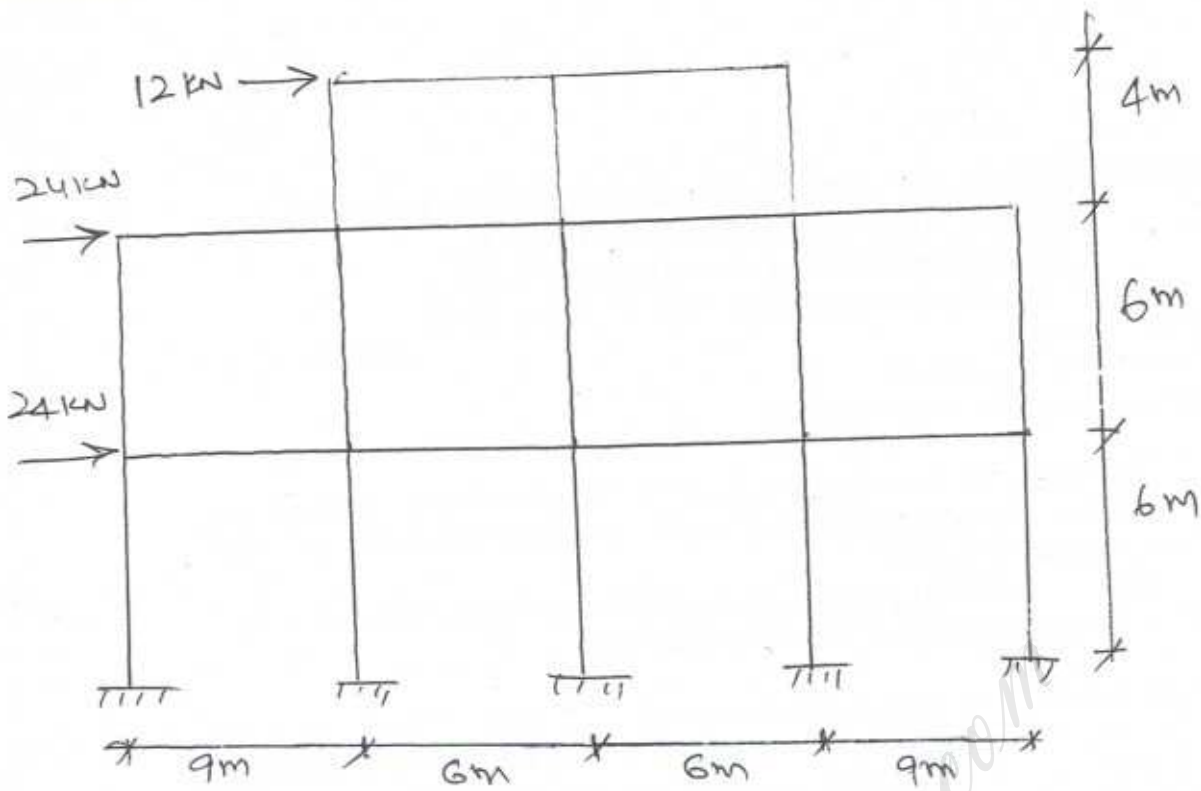


Fig. 4

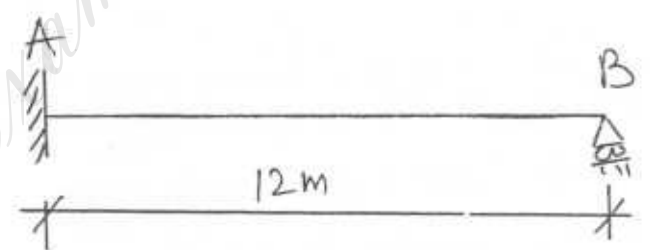


Fig. 5

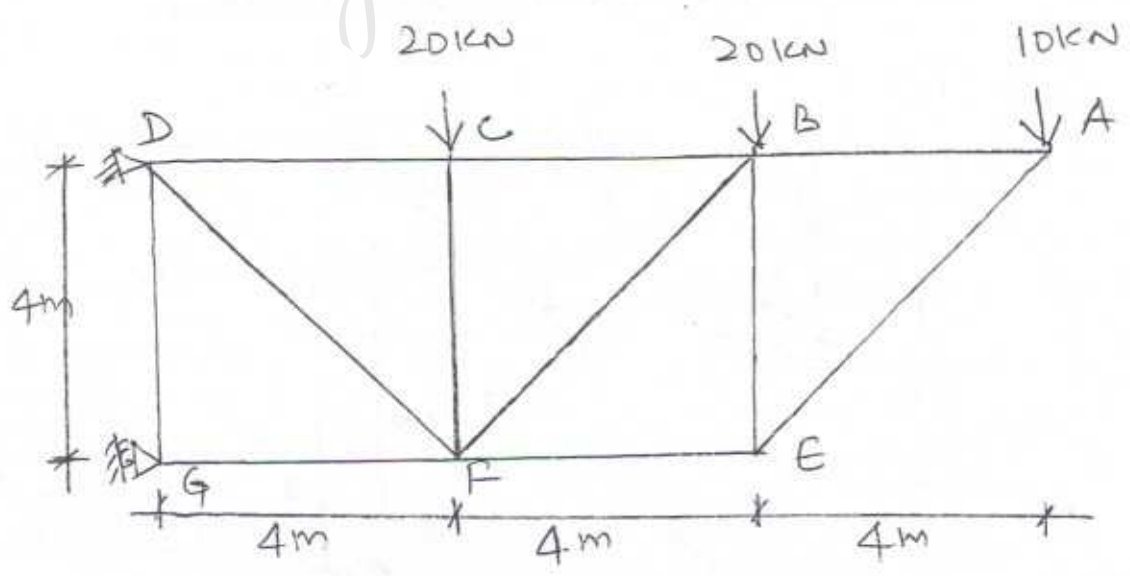


Fig. 6