

College of Engineering, Pune

ESE

T.Y. B. Tech. (Civil)

(CE 9005- Structural Analysis)

Date:- 25-11-14

Time: - 2:00 pm – 5:00 pm

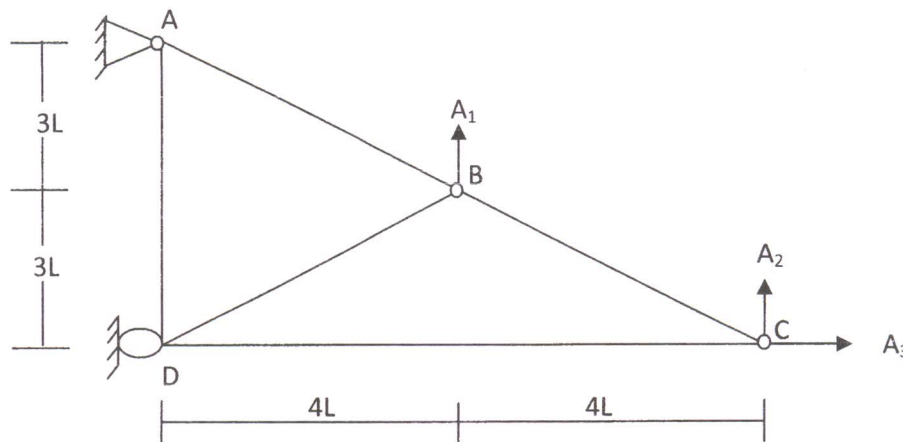
Maximum Marks: 60

Duration : - 3hr.

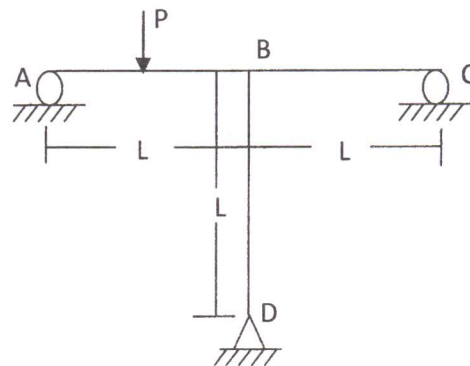
Instructions:

1. All questions are compulsory.
2. Marks of each question are indicated against it.
3. Assume suitable data wherever applicable and mention it clearly.
4. Use of mobile phones is strictly prohibited in the exam hall.

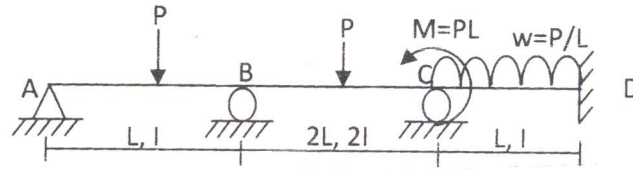
Q.1 For the truss shown in Fig. below determine all the coefficients of flexibility matrix using unit load method in the directions of the actions shown. All members are prismatic and have axial rigidity EA . (12)



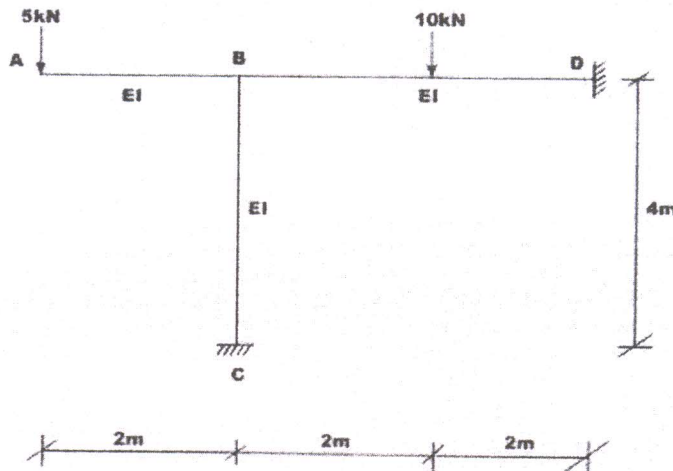
Q.2 Analyse the frame shown in Fig. below using flexibility method considering only flexural deformations. The flexural rigidity EI is the same for all members. (10)



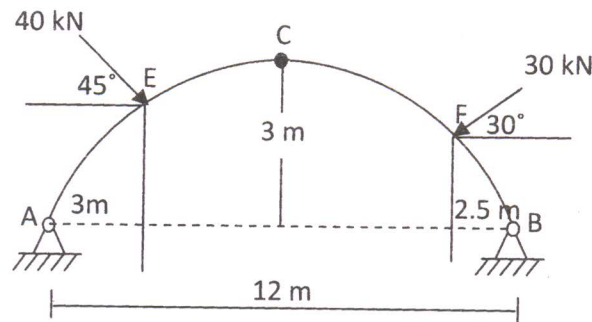
- Q.3 Analyse the three span continuous beam shown in Fig. below using stiffness method considering only flexural deformations. Also draw bending moment diagram. (10)



- Q.4 Analyse the frame shown in Fig. below using moment distribution method. Also draw the deflected shape and bending moment diagram. (10)



- Q.5 Draw bending moment diagram for a three hinged circular arch shown in Fig. below. Also find radial shear and normal thrust just to the left of point E. (10)



- Q.6 The velocity of a boat is given by the polynomial as : $v(t) = a_1t^2 + a_2t + a_3$ for $5 < t < 1$. If at $t = 5s$, $v = 106.8$ m/s, $t = 8$ s, $v = 177.2$ m/s and $t = 12s$, $v = 279.2$ m/s. Find the Velocity at $t = 6, 7.5, 9,$ and 11 seconds using Gauss elimination method. (8)