

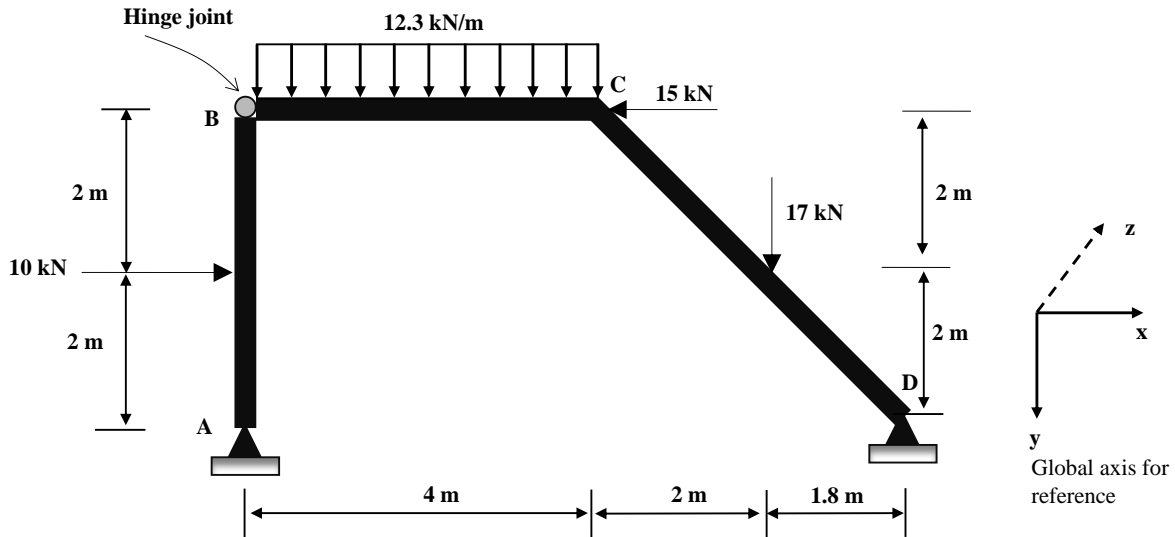
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI  
 Second Semester (2022-2023), Midsemester Examination  
 Course: Analysis of Structures (CE F241)

Date: 18<sup>th</sup> March 2023

Max. Marks: 90

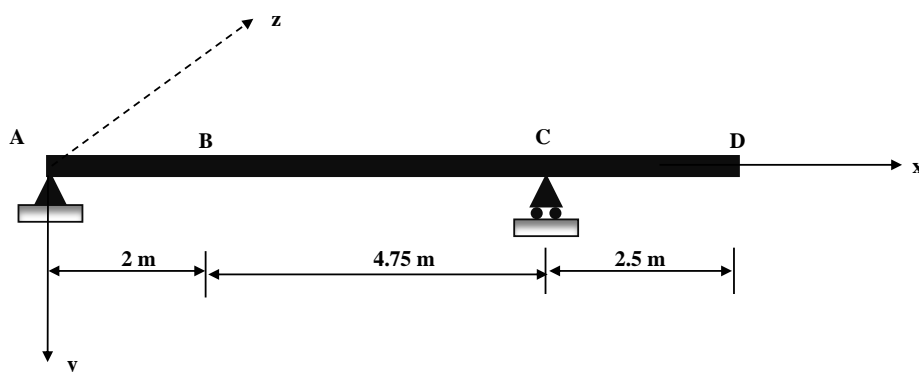
Duration: 9:00 AM-10:30 AM

Q.1 In the portal frame shown in **Fig.1**, find the reactions in the hinge supports A and D, find the internal forces at joint B and at joint C, where joint B is a hinge joint and joint C is a rigid joint. Also, Find the internal forces at center of member BC. [15]



**Fig.1**

Q.2 Draw the Influence Line Diagrams (ILDs) for Reaction at C and B.M. at B in the beam shown in **Fig.2**, finding equation of the Influence Lines in segments AC and CD for reaction at C and segments AB, BC and CD for B.M. at B, considering A as the origin. Using these ILDs find the reaction at C and B.M. at B if a uniformly distributed load of 10kN/m occupies the overhang portion CD. [20]



**Fig.2**

Q.3 In the beam shown in the **Fig.3**, find the S.F. and B.M. functions in all three segments (AB, BC and CD), considering point A as the origin. Draw the S.F.D. and B.M.D. mentioning the magnitudes. Find the maximum bending moment and its location in the beam. [20]

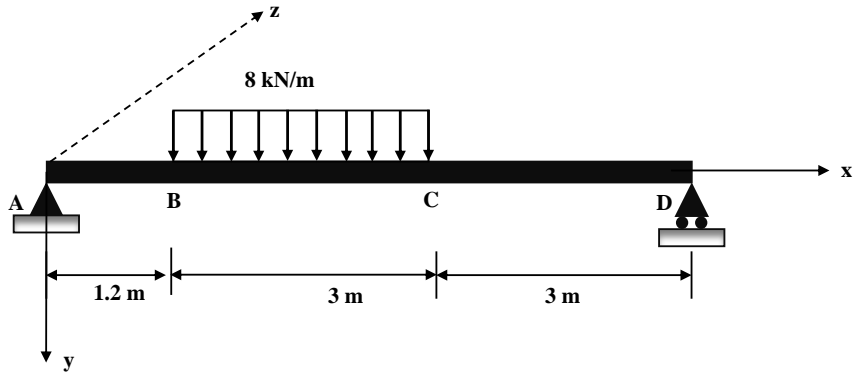


Fig.3

Q.4 Find the equation of the of the elastic curve (*i.e.* equation of deflection) of the beam shown in Fig.4 by double integration method. The beam is subjected to a linearly varying load as shown in the figure. Find the maximum deflection and its location. [20]

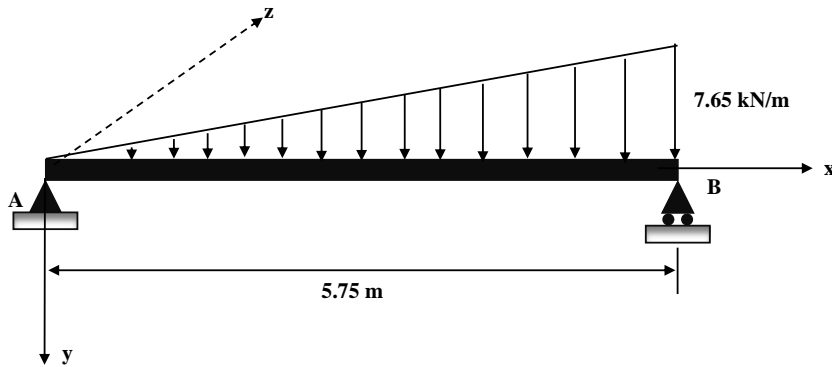


Fig.4

Q.5 In the truss shown in Fig.5, find the forces in the members CD, DJ, DI and HI, using method of sections. [15]

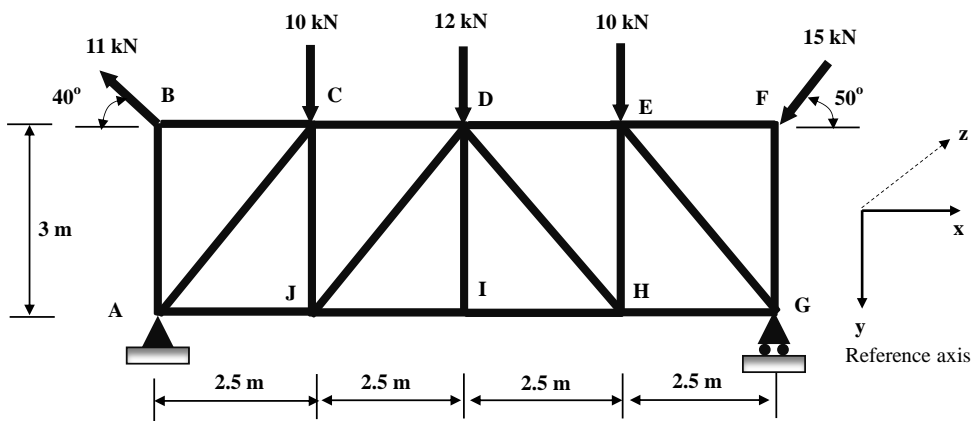


Fig.5