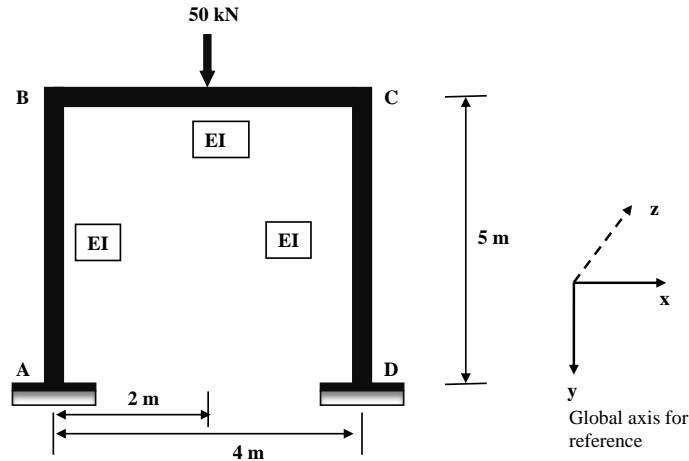# BIRLA INSTITUTE OF TECHONOLOGY AND SCIENCE, PILANI
Second Semester (2022-2023), Comprehensive Examination
Course: Analysis of Structures (CE F241)
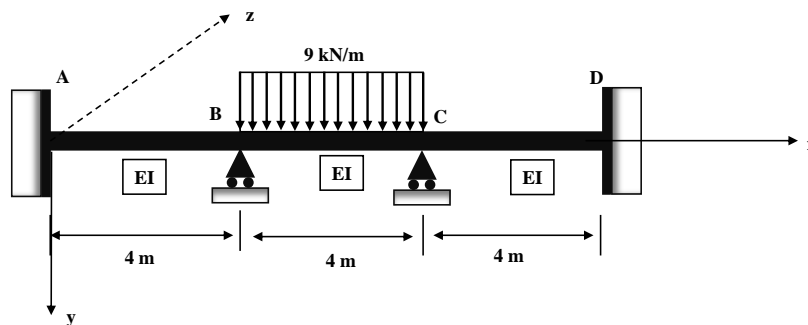
Date: 20th May 2023   Max. Marks: 120   Duration: 9:30 AM-12:30 PM

Q.1 Solve the portal frame shown in **Fig.1**, using moment distribution method. Find the moments at A, B, C and D points. EI of all the members is same. [20]
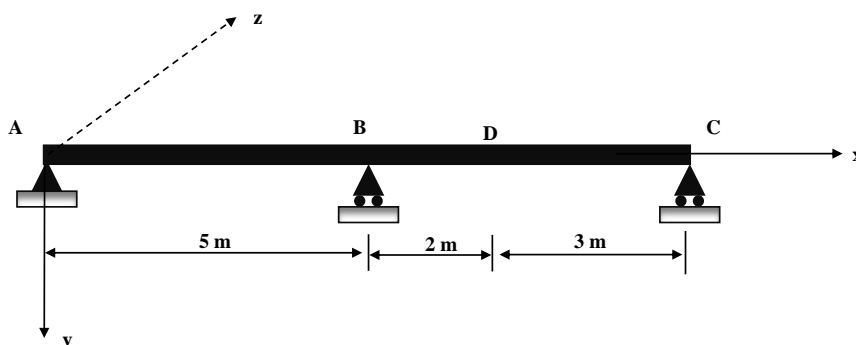

Fig.1

Q.2 Solve the beam shown in **Fig.2,** using slope-deflection method. Find the moments at A, B, C and D points. EI of all the members is same. [20]


Fig.2

Q.3 Draw the I.L.D. for B.M. at D of the continuous beam shown in the **Fig.3,** using Muller-Breslau principle along with conjugate beam method. Find the ordinate of the I.L.D. at D and at the center of span AB. EI of all the members is same. [30]
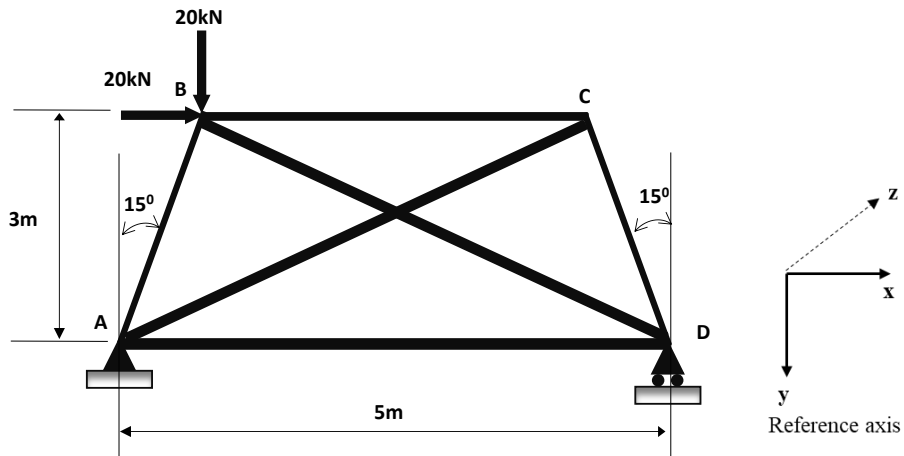

Fig.3

Q.4 Take the reaction at D as the redundant in the portal frame shown in **Fig.4**. Solve for that redundant using force method. [25]

15 kN/m

B   C

3 m

5 m

z

x

A   D

4 m

y
Global axis for
reference
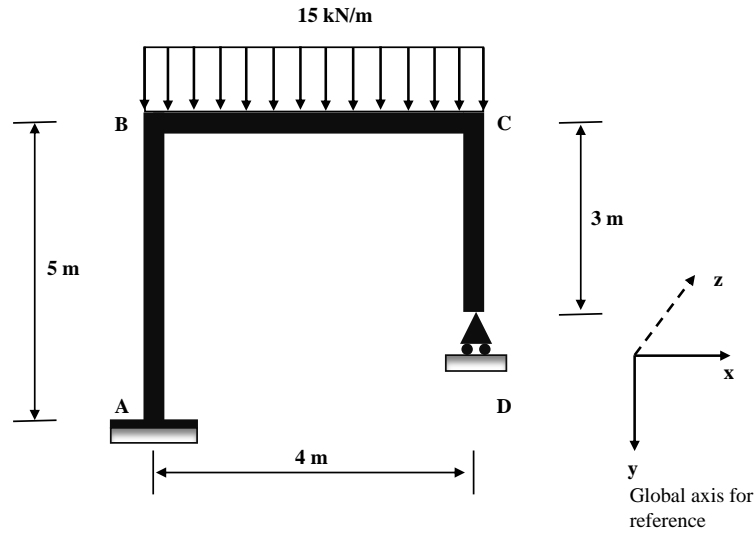
Fig.4

Q.5 In the statically indeterminate truss shown in **Fig.5**, consider the member force BC as the redundant and solve for it using force method. AE of all the members is same. The intersection point of the diagonal members AC and BD is not a joint. [25]

20kN

20kN   B   C

15^0 15^0

3m

z

x

A   D

5m

y
Reference axis

Fig.5