

Max.Marks:45

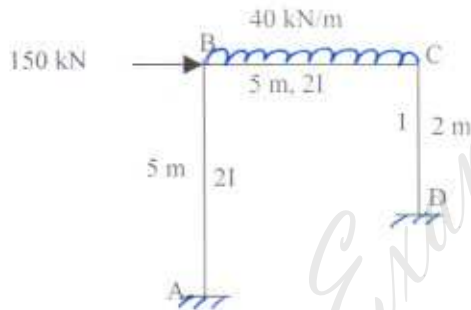
Time: 3 Hr.

Note : Attempt all Questions. All questions carries equal marks. Assume missing data if any suitably.

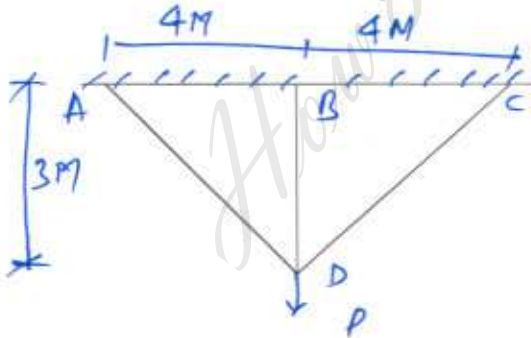
The following data is given for numerical integration

No. of sampling points	Points	Weights
1	0	2
2	± 0.57735	1
3	± 0.77459	0.555
	0	0.888

Q.No.1 Analyse the rigid frame shown below using stiffness transformation matrix method and draw bending moment diagram.



Q.No.2 Obtain the horizontal and vertical deflection for the truss shown below by representing in to one-dimensional bar element. Consider the area of all members of the truss to be same and equal to A and modulus of elasticity E to be constant.



Q.No.3 Obtain the coefficient of stiffness matrix for 3 noded isoparametric bar element. Take AE of the element as constant. Use numerical integration.

Q.No.4 Develop shape function for quadratic rectangular element of i) Lagrange family and ii) Serendipity family.

Q.No.5 A concentrated load whose x and y components are 10 kN and 16 kN is acting at point (4,5) in a four noded 2 D iso parametric element. The coordinates of nodal points are (0,0), (6,2), (6,6) and (1,5). Calculate the equivalent nodal load at all the nodal points.