Reg. No										

AY 24

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (First Semester) Regular Examinations, February – 2025

24MSEPE1011 - MATRIX METHOD OF ANALYSIS OF STRUCTURES

(Structural Engineering)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

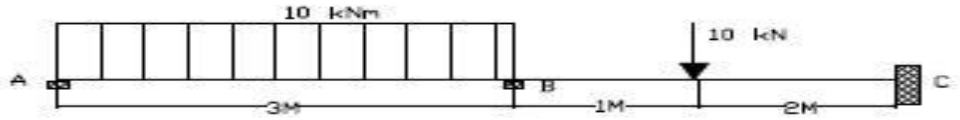
(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

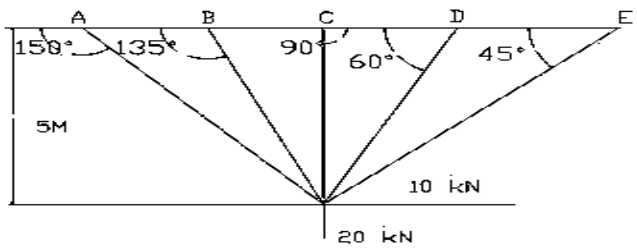
Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Differentiate pin-jointed plane frame and rigid jointed plane frame.	CO1	K2
b.	Write the requirements to be satisfied while analyzing a structure.	CO1	K1
c.	Define degree of freedom.	CO2	K3
d.	State principle of superposition.	CO1	K4
e.	Write the concept on which matrix method analysis is based.	CO2	K2

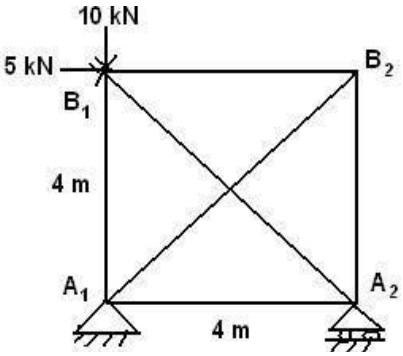
PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions		Marks	CO #	Blooms Level
2. a.	Explain Maxwell's reciprocal theorem.	5	CO3	K2
b.	State the comparison between force method and displacement method of analysis	5	CO3	K2
	(OR)			
c.	Differentiate pin-jointed plane frame and rigid jointed plane frame	5	CO4	K1
d.	List out the properties of rotation matrix.	5	CO3	K1
3.a.	Analyze the beam by flexibility matrix method. EI = constan	5	CO2	K3



b.	Draw shear force and bending moment diagram for above solution	5	CO1	K4
	(OR)			
c.	List out the assumptions made for plastic analysis	5	CO1	K2
d.	Write the limitations of load factor concept.	5	CO1	K2
4.a.	What do you mean stiffness method of matrix analysis?	5	CO1	K2
b.	What are the steps involved to solve the problem by using this method	5	CO1	K2
	(OR)			
c.	Solve the truss by any method of matrix $E = 2000\ kN/cm^2$ $A = 20\ cm^2$	5	CO2	K2



d.	What are the properties which characterize the structure response by means of force-displacement relationship	5	CO2	K2
5.a.	A Statically indeterminate frame shown in figure carries a load of 80 kN. Analyse the frame by matrix flexibility method. A and E are same for all member. 	5	CO1	K2
b.	Write short note on Flexibility coefficients	5	CO2	K2
	(OR)			
c.	Analyze the continuous beam having three spans each of 3m length by stiffness matrix method. Extreme ends are fixed and intermediate supports are roller supports. The beam carries 20 kN concentrated loads at mid-point of each span. EI = constant	5	CO2	K4
d.	Draw Shear Force Diagram and Bending Moment Diagram	5	CO2	K2
6.a.	Degree of Freedom and explain its types	5	CO1	K2
b.	What are the properties which characterize the structure response by means of force-displacement relationship	5	CO1	K2
	(OR)			
c.	Write short note on advantage of matrix method	5	CO1	K2
d.	Write short note on stiffness coefficients	5	CO2	K3

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