NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I M.TECH I Semester Regular Examinations, January-2025

R24

Sub Code: R24MCC101
Time: 3 hours

RESEARCH METHODOLOGY & IPR
(MD,CSE, STRE, PID, DECS, VLSI&ES)   Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 12M = 60M)

Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) Explain Clearly the objectives of Research Problem	K2	1	6M
			ii) Interpret different sources of research problem by giving suitable examples	K2	1	6M
			OR			
	b		i) Explain clearly research design process and steps to be followed	K2	1	12M
			Unit-II			
2	a		i) How do you design a research problem? Give an example to illustrate your answer	K2	2	6M
			ii) Discuss various issues involved in selecting a research problem. Also elaborate important features of a good research design.	K2	2	6M
			OR			
	b		i) Differentiate between qualitative research and quantitative research	K2	2	12M
			Unit-III			
3	a		i) Explain the procedure to determine the size of sample and discuss on sampling size	K2	3	6M
			ii) Explain the Concepts of Statistical Population	K2	3	6M
			OR			
	b		Explain different types of sampling techniques	K2	3	12M
			Unit-IV			
4	a		i) Explain new developments in Intellectual Property Rights.	K2	4	6M
			ii) Define intellectual property in research. Explain different types of intellectual property	K2	4	6M
			OR			
	b		i) Contrast the purpose and functions of trademarks	K2	4	6M
			ii) Write notes on trade secrets, precautions and maintenance	K2	4	6M
			Unit-V			
5	a		i) Exemplify the basic criteria of patentability of industrial designs	K2	5	6M
			ii) Explain the fundamentals of copyright laws	K2	5	6M
			OR			
	b		i) Describe briefly how the online patent data is organized	K3	5	6M
			ii) Describe the structure and content of a patent document in general.	K3	5	6M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I M. Tech I Semester Regular Examinations, January-2025

Sub Code: R24MNC102

DISASTER MANAGEMENT

Time: 3 hours

(STRE, P&ID, MD,DECS,VLSI&ES and CSE)

Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Describe types of disasters with examples.	K2&K3	C01	6M
		ii)) Explain About The Disaster Management Cycle	K2&K3	C01	6M
		OR			
	b	i) Explain how the Richter scale is used to measure the magnitude of an earthquake	K2&K3	C01	6M
		ii) Discuss various types of natural disasters in India and highlight their effects	K2&K3	C01	6M
		Unit-II			
2	a	Explain The causes of Floods and the effects of Floods in detail. Give one Case Study of The Floods.	K2&K3	C02	12M
		OR			
	b	Explain The causes of earthquakes and effects of earthquakes in detail. Give one Case Study of The earthquake.	K2&K3	C02	12M
		Unit-III			
3	a	i) Explain the Earthquake zones of India	K2&K3	C03	6M
		ii) explain assessing risk and vulnerability	K2&K3	C03	6M
		OR			
	b	What is drought? Explain the types of droughts. Explain drought mitigation with an integration of technology and people.	K2&K3	C03	12M
		Unit-IV			
4	a	i) what are the multimedia technologies of disaster risk management in remote sensing	K2&K3	C04	12M
		OR			
	b	i) what are the forewarning levels of disaster management	K2&K3	C04	6M
		ii) Explain About The Mass Media and disaster Management?	K2&K3	C04	6M
		Unit-V			
5	a	i) what are the disaster management acts and policies in India	K2&K3	C05	6M
		ii) What are the steps for formulating a disaster risk reduction plan?	K2&K3	C05	6M
		OR			
		What are favourable conditions for cyclone formation? How do you estimate risk from cyclonic conditions and safety precautions to save lives?	K2&K3	C05	12M

NAKASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I M.TECH I Semester Regular Examinations, January-2025

Sub Code: R24MSE102

THEORY OF ELASTICITY

(CE)

Time: 3 hours

Max. Marks: 60

R24

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 12M = 60M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	The state-of-stress at a point is given by the following array of terms. Find normal stress, shear stress and resultant stress on octahedral plane. Also find the principal stresses and its directions. $$\begin{bmatrix} 9 & 6 & 3 \\ 6 & 5 & 2 \\ 3 & 2 & 4 \end{bmatrix} MPa$$		1	12M
		OR			
	b	i) Explain conditions of plane stress and plane strains with suitable examples and derive the expressions for strain at a point.		1	6M
		ii) Explain the Hooks law relation between stresses and strains and the various components of stresses and strains.		1	6M
		Unit-II			
2	a	Write the application of Fourier series for two dimensional problems for gravity loading		2	12M
		OR			
	b	What is Airy's stress function? Discuss the application of stress function approach for solving of two dimensional bending problems		2	12M
		Unit-III			
3	a	i) Write about stress concentration factor.		3	6M
		ii) Write the equilibrium equation in 2-D element in polar coordinates.		3	6M
		OR			
	b	i) Develop displacements for symmetrical stress distributions		3	6M
		ii) What are the Strain components in polar co- ordinates? Explain		3	6M
		Unit-IV			
4	a	i) Explain about stress ellipsoid and stress director surface		4	6M
		ii) Write short explanatory notes on Homogeneous Deformation and principle of superposition		4	6M
		OR			
	b	Write in detail about Uniqueness of solution and Reciprocal theorem		4	12M
		Unit-V			
5	a	i) Illustrate the concept of membrane analogy with case study		5	6M
		ii) Write about the solution of Torsional problems using energy method		5	6M
		OR			
	b	i) Discuss about Bars with elliptical cross section		5	6M
		ii) Explain about Torsion of rectangular bars		5	6M

KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome M:Marks

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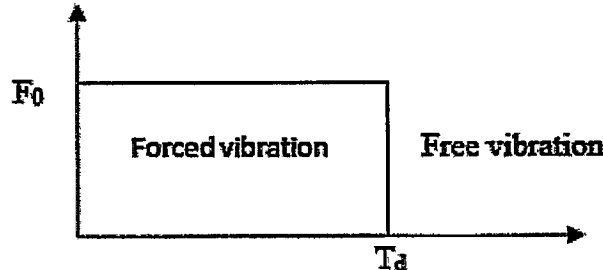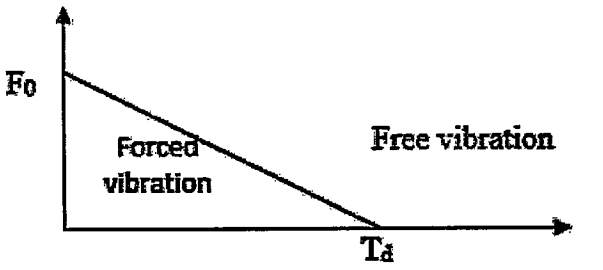
R24

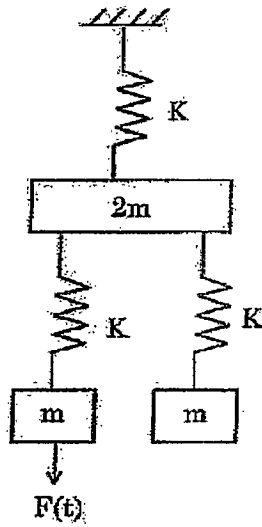Sub Code: R24MSE103   **STRUCTURAL DYNAMICS**

Time: 3 hours   (CE)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12M = 60M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain about lumped mass and Continuous mass system	2	1	6M
		ii) Briefly explain oscillatory motion	2	1	6M
		OR			
	b	i) Derive the expression for time period of simple harmonic motion	2	1	6M
		ii) Explain a) Degree of freedom system b) Harmonic Excitation	2	1	6M
2		**Unit-II**			
	a	Determine the response of SDOF system subjected to rectangular pulse load. 	3	2	12M
		OR			
	b	Determine the response of SDOF system subjected to triangle pulse load. 	3	2	12M
3		**Unit-III**			
	a	i) Briefly explain orthogonal properties of normal modes	2	3	6M
		ii) Derive the natural frequency for uniform beam having both end fixed	2	3	6M
		OR			
	b	i) Determine the amplitude of motion of three masses shown in fig. when a harmonic force F(t) = Fo Sin ωt is applied. Take m=1.5kg K= 1500N/m Fo = 10N ω= 10 rad/s . Use mode superposition method	3	3	12M

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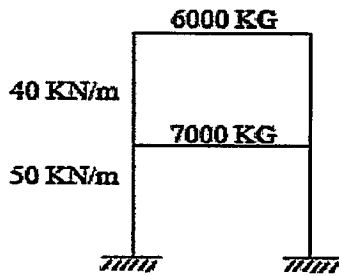<tr><td rowspan="2">a</td><td>Draw the mode shapes for given problem</td><td>3</td><td>4</td><td rowspan="2">12M</td></tr>
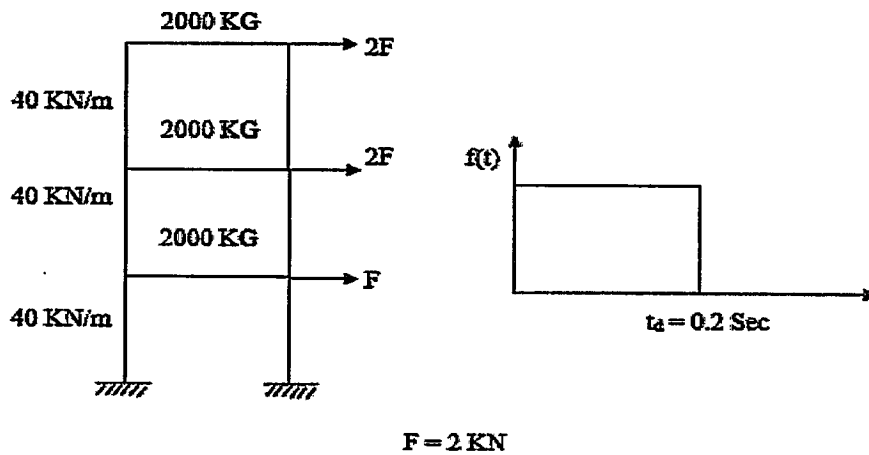<tr><td></td><td></td><td></td></tr>
<tr><td colspan="5" align="center">OR</td></tr>
<tr><td rowspan="2">b</td><td>Draw the mode shapes for given problem</td><td>3</td><td>4</td><td rowspan="2">12M</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="5" align="center">Unit-V</td></tr>
<tr><td rowspan="2">a</td><td>i) Define earthquake size and write detailed classification of earthquakes</td><td>2</td><td>5</td><td>6M</td></tr>
<tr><td>ii) Write about the Systems on Rigid Foundations</td><td>2</td><td>5</td><td>6M</td></tr>
<tr><td colspan="5" align="center">OR</td></tr>
<tr><td rowspan="2">b</td><td>i) Write about Lumped SDOF Elastic Systems</td><td>2</td><td>5</td><td>6M</td></tr>
<tr><td>ii) Explain about Translational Excitations</td><td>2</td><td>5</td><td>6M</td></tr>
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KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome M:Marks

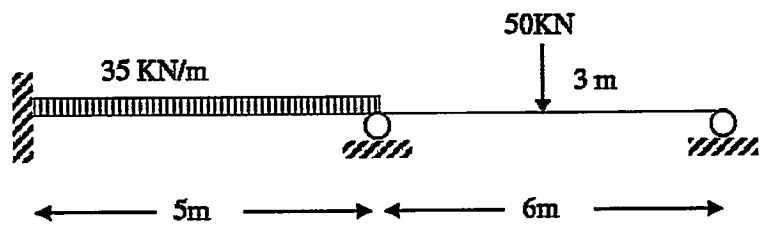## I M.TECH I Semester Regular Examinations, January-2025
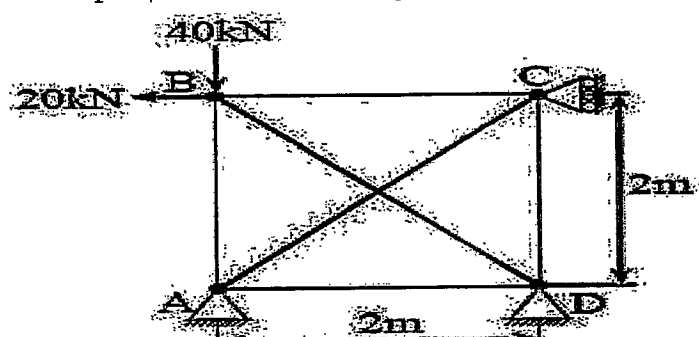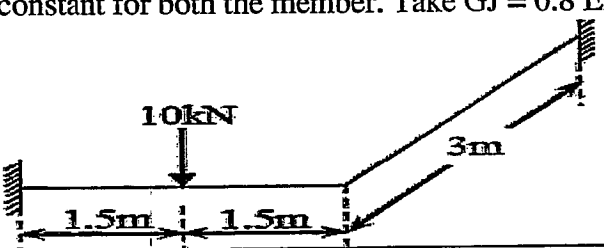
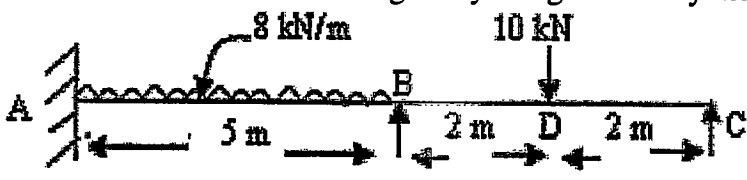**Sub Code: R24MSE104** **MATRIX ANALYSIS OF STRUCTURES**

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 12M = 60M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain about structural idealization.	KL2	1	6M
		ii) Write about stiffness matrix for a 2D beam element.	KL2	1	6M
		OR			
	b	i) What is meant by degree of static indeterminacy and degree of kinematic indeterminacy of structure? Explain them through examples.	KL2	1	6M
		ii) Develop Element stiffness matrix for truss element.	KL3	1	6M
		Unit-II			
2	a	i) A two span continuous beam carries loading as shown. Solve the problem by stiffness method. Sketch Bending moment diagram.	KL4	2	12M
		OR			
	b	i) Develop stiffness matrix for a given truss:	KL4	2	12M
		Unit-III			
3	a	i) Formulate stiffness matrix for the grid shown in fig. EI = constant & GJ =constant for both the member. Take GJ = 0.8 EI.	KL4	3	12M
		OR			
	b	i) Derive Stiffness matrix for a grid element.	KL3	3	6M
		ii) Explain procedure for analysis of curved beam element in vertical plane deriving stiffness formulation	KL2	3	6M

		Unit-IV			
4	a	i) Explain a) Banded Matrix and Semi Band Width. b) Method of static condensation c) Method of sub structuring for analysis of large structures	KL2	4	12M
		OR			
	b	i) Explain about inertial & thermal stresses.	KL2	4	6M
		ii) Explain about Beams on elastic foundation by stiffness method.	KL2	4	6M
		Unit-V			
5	a	i) Draw BMD for the beam shown in figure by using Flexibility method. 	KL4	5	12M
		OR			
	b	i) Analyse the continuous beam in figure by flexibility method. 	KL4	5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks

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I M.TECH I Semester Regular Examinations, January-2025

Sub Code: R24MSE109   REPAIR AND REHABILITATION OF STRUCTURES

Time: 3 hours   (CE)   Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 12M = 60M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) What is the effect of moisture and temperature in concrete.	KL2	1	6M
		ii) Write short notes on different types of admixtures.	KL2	1	6M
		OR			
	b	i) Describe the concrete behavior under corrosion.	KL2	1	6M
		ii) Explain in detail about Pull out test.	KL2	1	6M
		Unit-II			
2.	a	i) Describe shear capacity strengthening with a neat sketch.	KL2	2	12M
		OR			
	b	i) What is meant by stabilization and explain the types of stabilization techniques.	KL2	2	12M
		Unit-III			
3	a	i) Define the terms bonded and debonded mechanisms and explain the types of techniques involved in it.	KL2	3	12M
		OR			
	b	i) Explain about strengthening of floor of structures.	KL2	3	12M
		Unit-IV			
4	a	i) What are the applications of Fibre reinforced concrete?	KL2	4	6M
		ii) Examine the durability of fly ash modified concrete.	KL3	4	6M
		OR			
	b	i) Discover the properties and reaction mechanism of fly ash modified concrete.	KL2	4	12M
		Unit-V			
5	a	i) Explain in detail about High Performance Concrete.	KL2	5	6M
		ii) Explain about the Materials of high performance concretes.	KL2	5	6M
		OR			
	b	i) Describe the Properties of Self Consolidating Concrete.	KL2	5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome   M:Marks