NARASIMHAREDDYENGINEERING COLLEGE
(Autonomous)
Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad
Accredited by NAAC with A Grade, Accredited by NBA

CIVIL ENGINEERING QUESTION BANK

Course Title: STRUCTURAL ANALYSIS-I

Course Code: CE3101PC

Regulation   : NR21

Course Objectives: The objective of the course is to

- Differentiate the statically determinate and indeterminate structures.
- To understand the nature of stresses developed in perfect frames and three hinged arches for various types of simple loads
- Analyze the statically indeterminate members such as fixed bars, continuous beam sand for various types of loading.
- Understand the energy methods used to derive the equations to solve engineering problems.
- Evaluate the Influence on abeam for different static & moving loading positions

Course Out comes: At the end of the course the student will able to

CO1: An ability to apply knowledge of mathematics, science, and engineering
CO2: Analyze the statically indeterminate bars and continuous beams
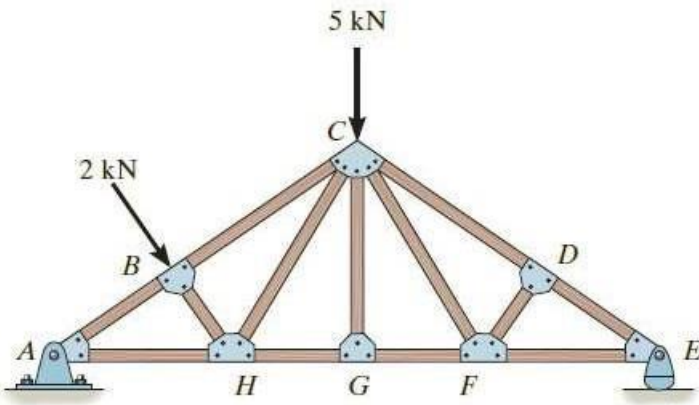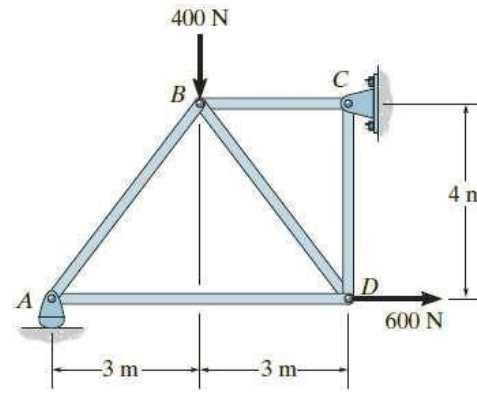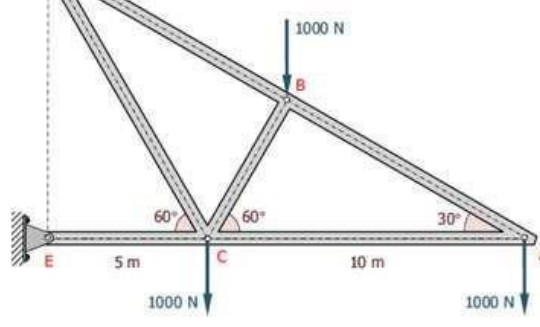**CO3:** Draw strength behavior of members for static and dynamic loading. Calculate the stiffness parameters in beams and pin jointed trusses.
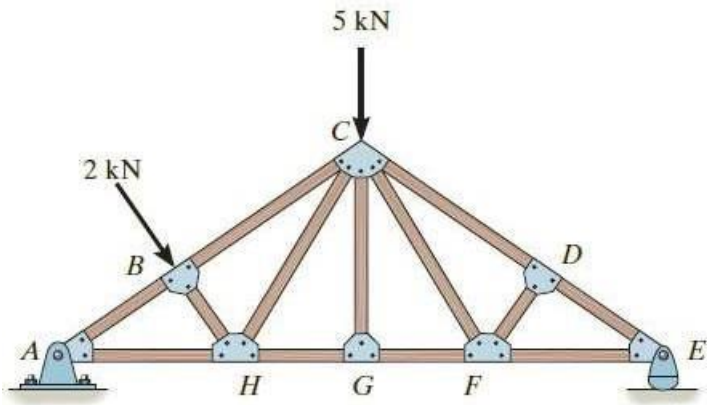**CO4:** Understand the indeterminacy aspects to consider for a total structural system.
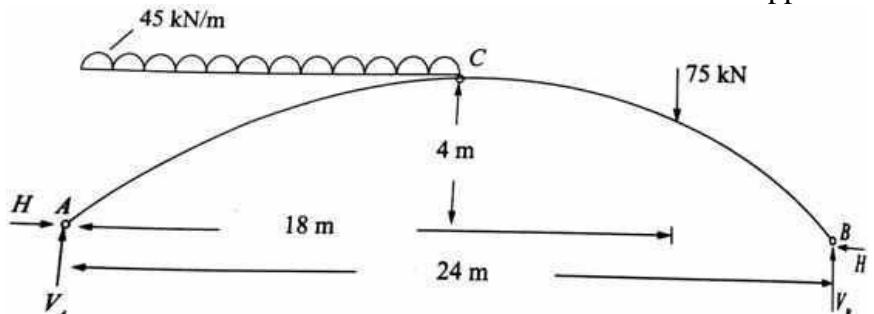**CO5:** Identify, formulate, and solve engineering problems with real time loading

UNIT–I

S.No	Questions	BT	CO	PO
Part–A(Short Answer Questions)				
1	Define frame	L2	1	PO1 PO5
2	Write the short notes on method of sections	L2	1	PO1
3	Explain pin jointed frame.	L2	1	PO5
4	Write the short notes on method of joints	L2	1	PO1
5	Define Castigliano's theorem	L1	1	PO5
6	Explain the types of supports	L2	1	PO1
7	What are advantages of method of sections	L2	1	PO5
8	What is DOF	L2	1	PO1
9	What is kinematic indeterminacy.	L1	1	PO5
10	Explain static indeterminate structure	L2	1	PO1
Part– B(Long Answer Questions)				

11	a)	Analyse using method of joints from fig.	L4	1	PO4
12	a)	Determine the force in each member of the truss shown in Figure. Indicate whether the members are in tension or compression.	L4	1	PO4
13	a)	Define castiglions theorems	L1	1	PO1
	b)	What are difference between determinate and indeterminate Structures.	L2	1	PO5
14	a)	The cantilever truss in Figure is hinged at D and E. Find the force in each member.	L4	1	PO4

15	a)	 Analyse the method of joints from fig.	L4	1	PO4
16	a)	Write analysis procedure for method of joints	L2	1	PO1
	b)	Write analysis procedure for method of sections	L2	1	PO5
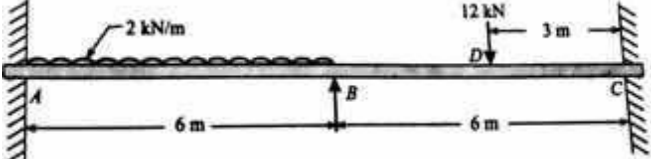
UNIT–II

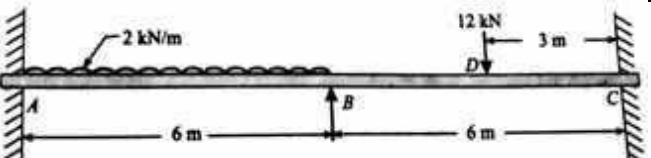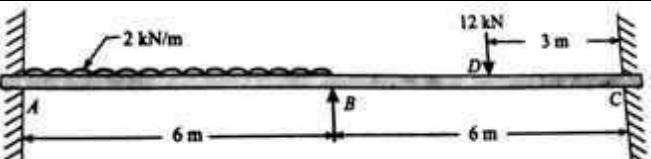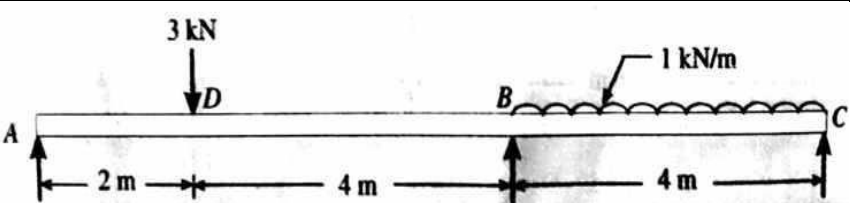| S. No		Questions	B T	C O	PO
		Part–A(Short Answer Questions)			
1		Define strain energy	L2	2	PO1 PO5
2		List out types of arches	L2	2	PO1
3		Explain linear arch	L2	2	PO5
4		State the eddy s theorem	L2	2	PO1
5		Explain temperature effect on three hinged arch	L1	2	PO5
6		Write short notes on tie arch	L2	2	PO1
7		What are the advantages 3hinged arch	L2	2	PO5
8		Write short note on rib shortening of three hinged arch	L2	2	PO1
9		What are difference between arch and beam	L1	2	PO5
10		Write short note on unit load method	L2	2	PO1
		Part– B(Long Answer Questions)			
11	a)	Analyze a steel beam of uniform cross-section is simply supported on a span of 10m and caries concentrated loads of50,100and 150KN at a distances of 2m, 5m and 6m from the lefts supports. Compute the deflection under 150KN load using unit load method.	L4	2	PO4
12	a)	Analyze a three hinge parabolic arch and determine the moment, normal rust and radial shear at a section 6m from the left support 	L4	2	PO4
13	a)	Analyze a steel beam of uniform cross-section is simply supported On a span of 12m and caries concentrated loads of50,100and	L4	2	PO4

		150KN at a distances of2m,6m and6m from the left supports. Compute the deflection under 140KNload using unit load method.			
14	a)	Analyze a three hinge parabolic arch and determine the moment, normal rust and radial shear at a section 5m from the right support	L4	2	PO4
15	a)	Derive expression for strain energy theorem.	L5	2	PO4
	b)	Explain linear arch	L2	2	PO4
16	a)	Analyze a simply supported beam with variable moment of inertia supports a uniformly distributed load of 14KN/m. Estimate the deflection at the center of the beam	L4	2	PO4

UNIT–III

S.No	Questions	BT	CO	PO
	Part–A(Short Answer Questions)			
1	Define prop reaction	L2	3	PO1 PO5
2	Explain advantages of fixed beam	L2	3	PO1
3	Write short note on propped cantilever beam	L2	3	PO5
4	Define degree of freedom	L2	3	PO1
5	What is KOI	L1	3	PO5
6	What are types of indeterminacy	L2	3	PO1
7	Explain analysis procedure for propped cantilever beam	L2	3	PO5
8	Write short note on fixed beam	L2	3	PO1
9	What is DOF for propped cantilever beam	L1	3	PO5
10	Expain the elastic curve of beams	L2	3	PO1
	Part– B(Long Answer Questions)			
11	a) Analyse from fig draw SFD and BMD	L4	3	PO4
12	a) Propped cantilever beam of udl10kn/m over entire span is	L4	3	PO4

13	a)	5m.calculate prop reaction. Draw SFD and BMD Analyse from fig. Draw SFD and BMD	L4	3	PO4
14	a)	Propped cantilever beam ofudl18kn/m over entire span is 4m. Calculate prop reaction. Draw SFD and BMD	L4	3	PO4
15	a)	Propped cantilever beam of point load 15kn span is 4m. calculate Prop reaction. Draw SFD and BMD	L4	3	PO4
16	a)	Propped cantilever beam of UDL 20kn/m over entire span is 4m. Calculate prop reaction. Draw SFD and BMD	L4	3	PO4

UNIT–IV

S.No		Questions	BT	CO	PO
Part–A(Short Answer Questions)					
1		What is single bay of frames	L2	4	PO1 PO5
2		What is side sway of frames	L2	4	PO1
3		Explain portal frames.	L2	4	PO5
4		What is static indeterminacy of continuous beam	L2	4	PO1
5		Write equation of three moment theorem	L1	4	PO5
6		Explain advantages of continuous beam	L2	4	PO1
7		What is static indeterminacy of pin jointed frame	L2	4	PO5
8		Define sway frame	L2	4	PO1
9		What is non sway frame	L1	4	PO5
10		Write applications of continuous beam	L2	4	PO5
Part– B(Long Answer Questions)					
11	a)	Draw bending moment and shear force diagram of the beam shown in figure by using three moment theorem	L4	4	PO4
12	a)	Draw bending moment and shear force diagram of the beam shown in figure by using slope deflection method	L4	4	PO4
13	a)		L4	4	PO4

		Analyze a continuous beam ABC 10m long rest on three supports A,B and C at the same level and is loaded as shown in figure. Using three moment theorem			
14	a)	Analyze a continuous beam ABC 10m long rest on three supports A, B and C at the same level and is loaded as shown in figure. slope deflection method .	L4	4	PO4
PO4	a)	Explain advantages of continuous beam	L2	4	PO5
15	b)	Explain analysis procedure for slope deflection method	L2	4	PO5
16	a)	Draw bending moment and shear force diagram of the beam shown in figure by using three moment theorems	L4	4	PO4

UNIT–V

S.No		Questions	BT	CO	PO
Part–A(Short Answer Questions)					
1		Define influence line	L2	5	PO1 PO5
2		Write short note on Muller Breslau principle	L2	5	PO1
3		What is absolute maximum shear force	L2	5	PO5
4		What is plane truss	L2	5	PO1
5		What are difference of Pratt and warren trusses	L1	5	PO5
6		Write short notes on focal length	L2	5	PO1
7		What is absolute maximum bending moment	L2	5	PO5
8		List out types of trusses	L2	5	PO1
9		Write short note on rolling load of beam	L1	5	PO5
10		Write influence line diagram	L2	5	PO5
Part– B(Long Answer Questions)					
11	a)	Write short note on ILD	L2	5	PO4
	b)	Write classification of trusses .	L2	5	PO4
12	a)	DrawILDforproppedcantileverbeamofspan6m.DrawSFDand BMD	L4	5	PO4
13	a)	Draw the influence line for reaction at A for the beam as shown in fig	L4	5	PO4
14	a)	Draw influence line for reaction at c for the beam as Shown in fig.	L4	5	PO4

15	a)	Write about Muller Breslau's principle	L2	5	PO4
	b)	Explain on focal length for beams	L5	5	PO4
16	a)	Draw ILD for propped cantilever beam of span10m. Draw SFD and BMD	L4	5	PO4

***Blooms Taxonomy Level (BT)**(L1–Remembering;L2–Understanding;L3–Applying;L4– Analyzing; L5 – Evaluating; L6 – Creating)

Course Out comes (CO)

Program Out comes (PO)

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