Name: ....   Roll No: ....

VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY TECHNICAL CAMPUS, KILIMANOOR, THIRUVANANTHAPURAM-695602

Fifth Semester B. Tech Degree - 2019 Scheme

Internal Examination -I

CIVIL ENGINEERING
ODD SEMESTER (2022-2023)

CET301 STRUCTURAL ANALYSIS - I

Date: 11.11.2022   Duration: 2 Hours   Max. Marks: 50

PART-A

**Answer all questions, each carries 3 marks**   **(15 Marks)**

Qn.No.	Questions	Marks	CO	BL
1.	List the basic assumptions in the analysis of trusses.	3	1	L3
2.	Explain Castigliano's theorem for deflection.	3	2	L3
3.	Explain the principle of virtual work as applicable to deformable bodies.	3	2	L3
4.	Find the deflection at the middle point C of the simply supported beam of length 7m, loaded as shown in figure by unit load method. Assume the flexural rigidity EI = 8×10^4 kNm^2.	3	2	L3
5.	State and prove Betti's Theorem.	3	2	L3

PART-B

Answer any one full question from each part   **(35 Marks)**

Qn.No.	Questions	Marks	CO	BL
6.	Analyse the truss shown in figure using method of joints and tabulate the member forces.	14	1	L3
	OR			
7.	A truss of span 5 m loaded as shown in figure. Find the reaction and forces in the members BC, CE and DE.	14	1	L3
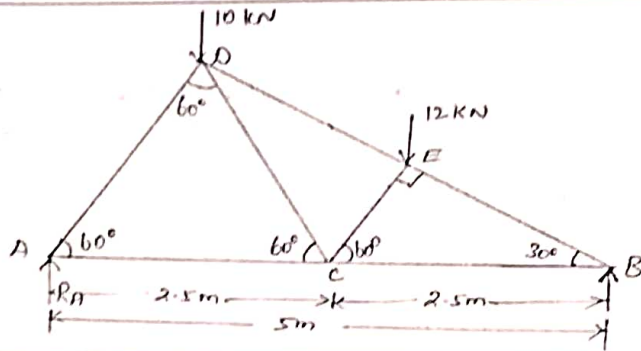
8.	A simply supported beam carries UDL over the entire span AB. Using unit load method, find the deflection at the center 'C' of the beam.	14	2	L3

OR

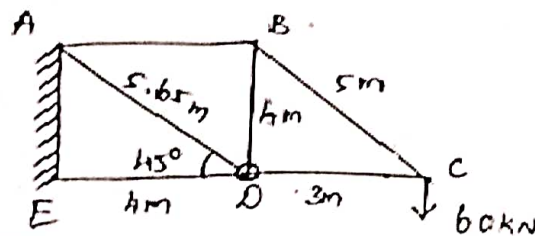|				
9.	State and explain Castigliano's first theorem for deflection.	14	2	L3
10.	Analyse the beam shown using consistent deformation method.	7	3	L4
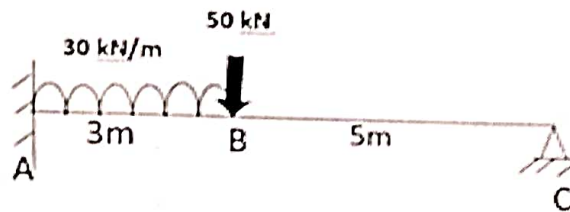
OR

11.	By using unit load method, determine the vertical deflection at point D in the truss, the cross sectional area for members AD, DE is 1500 mm² and that for other members is 1000 mm². Modulus of elasticity, E = 200 kN/mm².	7	3	L3

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CET301 STRUCTURAL ANALYSIS - I

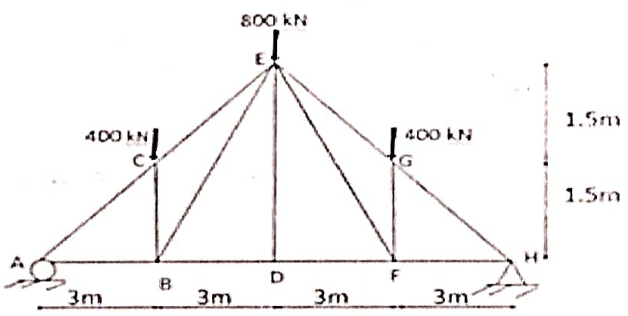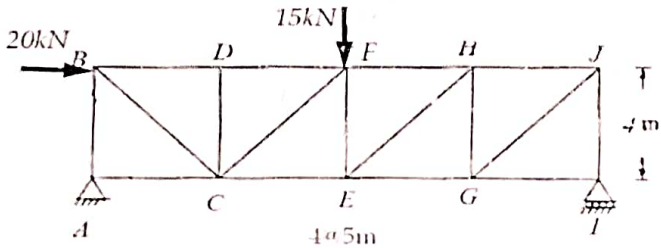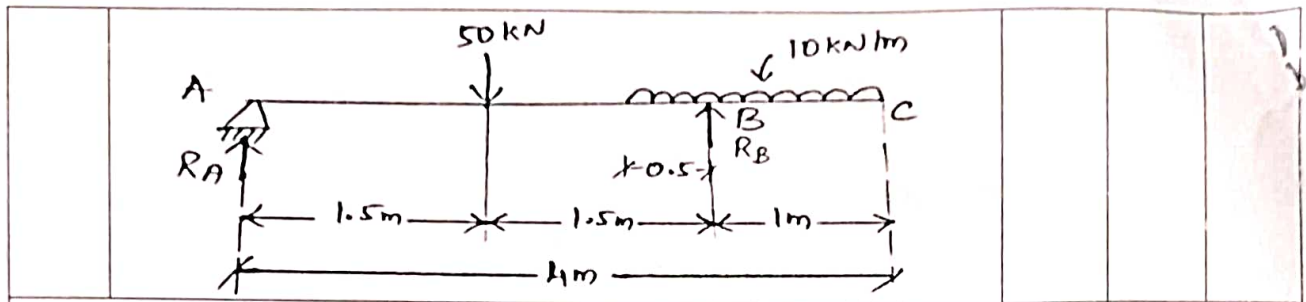Date: 11.11.2022   Duration: 2 Hours   Max. Marks: 50

PART-A

Answer all questions, each carries 3 marks   (15 Marks)

| Qn.No.	Questions	Marks	CO	BL
1.	What is equilibrium condition?	3	1	L3
2.	Write about the assumptions in truss design.	3	1	L3
3.	Define Compatibility condition	3	2	L3
4.	What are the assumptions made in the unit load method?	3	2	L3
5.	Differentiate determinate and indeterminate of structure.	3	2	L3

PART-B

Answer any one full question from each part   (35 Marks)

Qn.No.	Questions	Marks	CO	BL
6.	Analyse the pin jointed truss as shown in figure by the method of joints.	14	1	L3
	OR			
7.	Find the member forces in FH, EH and EG using method of sections.	14	1	L3
8.	Determine the deflection at the free end of overhanging beam shown in figure using unit load method.	14	2	L3

The figure shows a beam with support at A (R_A), a 50 kN point load, a 10 kN/m distributed load near B, support R_B at B, and point C. Dimensions: 1.5m, 1.5m, 1m (total 4m). Marked $\leftarrow$0.5$\rightarrow$.

OR

9.	Analyse the propped cantilever beam shown in figure using consistent deformation method.	14	2	L3

80 kN at D, 100 kN at C. A to D = 3m, D to B = 3m, B to C = 2m. Support at A (fixed), support at B.
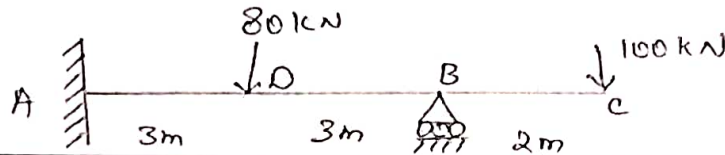
10.	A beam 4 m long is freely supported at its ends. It carries concentrated loads of 20 kN each at points 1 m from the ends. Calculate the maximum slope and deflection of the beam, using moment area method. Take EI=13,000 kNm².	7	2	L3

OR

11.	Explain in detail about Maxwell's law of reciprocal deflection.	7	2	L3

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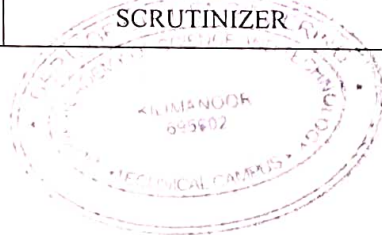
VIDYA ACADEMY OF SCIENCE & TECHNOLOGY TECHNICAL CAMPUS, KILIMANOOR

(A Unit of Vidya International Charitable Trust)

Department of Civil Engineering

INTERNAL EXAMINATION 1 / 2 - QUESTION PAPER REVIEW CHECK LIST

Name of the course with code	CET 301 Structural Analysis - 1
Faculty in charge	Dr. k. Sanandan.

Sl. No.	Description	Question paper 1		Question paper 2		Comments
		Yes	No	Yes	No	
1	Are course code, name, marks and duration mentioned?	✓		✓		
2	Is the question paper set for 50 marks?	✓		✓		
3	Whether the questions are distributed evenly according to the modules/topics?	✓		✓		
4	Whether 50% of the questions are of higher order thinking skills?	✓		✓		
5	Whether usage of code books and tables needed for answering the questions are mentioned ?	✓		✓		
6	Whether spelling, typing error and grammatical errors have been checked?		✓	✓		
7	Are there any repetitive questions among the sub divisions?		✓		✓	
8	Whether the question numbers are sequential ?		✓	✓		
9	Whether all questions are mapped against corresponding COs?	✓		✓		
10	Whether Bloom's Taxonomy levels of all questions are mentioned?	✓		✓		

Additional comments if any?

Name & Designation of the Reviewers	JISHA.G.S AP, CE	Lenin Baba. S AP, CE
Signature with date		
Signature of HoD with date		