SANSKRITI UNIVERSITY	**SANSKRITI UNIVERSITY** Mathura, Uttar Pradesh	**Enrol. No:**

Semester End Examination - January 2022
Course Code : CLE 303 Course Name : Structural Analysis
School of Engineering & Information Technology
Programme: B.Tech (Civil)(Regular & Lateral) **Semester: V**

Time: 3 hrs **Max. Marks:100**

PART – A (10 questions X 2 marks = 20 Marks)
Answer ALL the Questions

1. Attempts all parts. All parts carry equal marks. Write answer of each part in short.
   a. What do you mean by rolling loads? **[2]**
   b. Define static indeterminacy? **[2]**
   c. Derive fundamental equations in details with diagram **[2]**
   d. Define Maxwell`s Reciprocal theorem. **[2]**
   e. Distinguish between a deficient and a redundant truss. Explain with suitable example. **[2]**
   f. What do you mean by ILD? **[2]**
   g. What do you understand by Rolling Loads? **[2]**
   h. What do you understand by Unit Load Method? **[2]**
   i. What is Truss? **[2]**
   j. Define unsymmetrical bending? **[2]**

PART – B (4 questions X 5 marks = 20 Marks)
(Answer all questions)

2. Classify the arch on the basis of different criterion. **[5]**
3. What do you mean by ILD and what is its important of structural analysis? **[5]**
4. Write short notes on: - i) principal axes ii) Shear center and Theory of failure **[5]**
5. Derive of Three Moment Equations and Application of Three Moment Equation. **[5]**

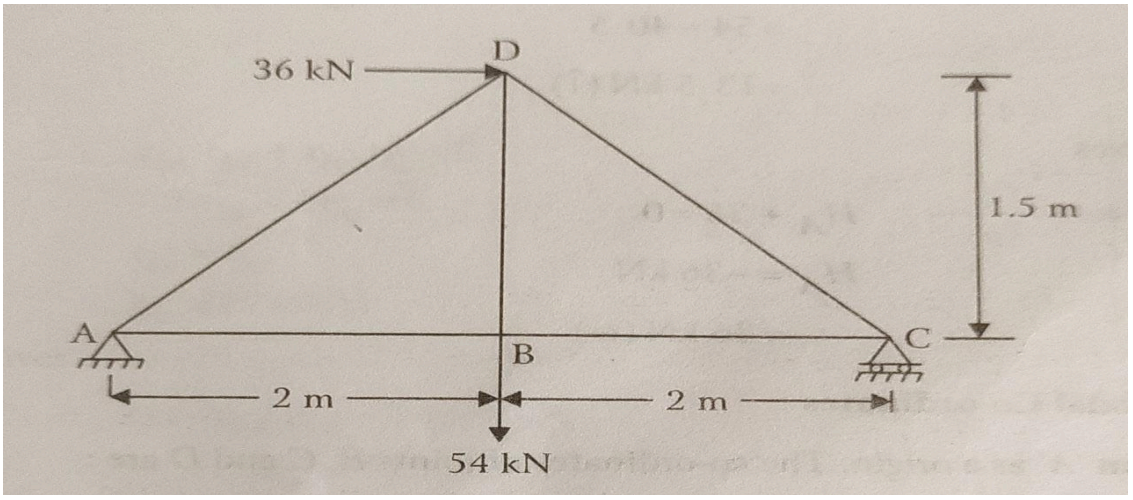
PART – C (3 questions X 10 marks = 30 Marks)
Answer Three out of Four Questions

6. Define unsymmetrical bending? Explain why unsymmetrical bending develop in beam **[10]**
7. Determine the slope and deflection at free end of a cantilever beam of span L, uniformly loaded with load 'w'. Use unit load method. EI = Constant. **[10]**
8. Drive the expression to calculate horizontal thrust in a two-hinge symmetrical parabolic arch carry general loading. **[10]**
9. (a) A fixed beam CD, carries a point load W at a distance L/2 from the support C. **[10]**
   (b) Calculate the slope and deflection using conjugate beam method. Take EI constant and draw bending moment diagram.

PART – D (2 questions X 15 marks = 30 Marks)
Answer Two out of Three Questions

10. A 3-hinge parabolic arch has been span of 10m & a rise of 5m. Its carry udl of 10kN/m over its left half of its span and point load of 100kN at 5m from the right end. Find the BM, Normal thrust. **[15]**

11. Using the method of tension coefficients analyze the plane truss shown in fig. and find the forces in the members. **[15]**



12.(a) Two-point loads of 120KN spaced 5m apart cross a girder of 25m span from left to right with the 120kN load leading. Calculate the maximum +ve SF and maximum -ve SF and the absolute maximum BM and draw the maximum shear force and maximum BM diagram. **[15]**

(b) Three-hinged arch is determinate structure. Explain in brief.