



DEPARTMENT OF CIVIL ENGINEERING
STRUCTURAL ANALYSIS-II (CEL331)
MINOR EXAMINATION-I

Sheet Metal

2014 CE10342

Date: 31/08/2013

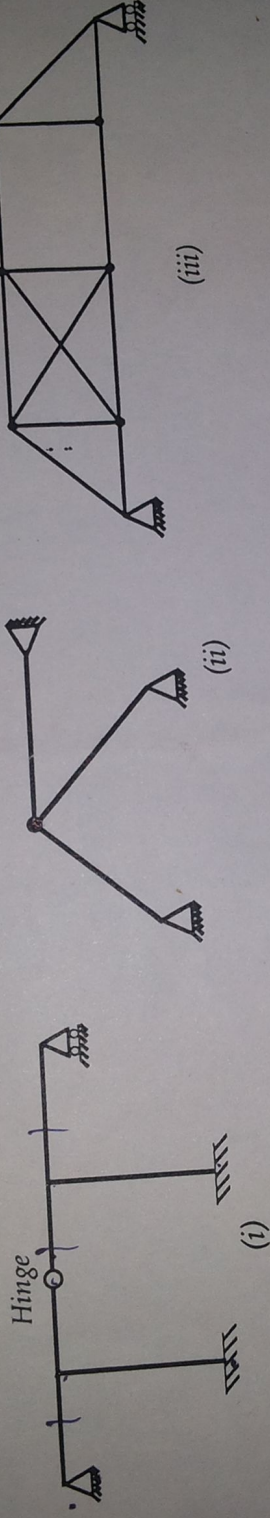
Time Allowed: 01 Hour

Max. Marks = 25

Q#1: Short-type questions. Answer briefly with appropriate figures, if applicable. (04 Marks)

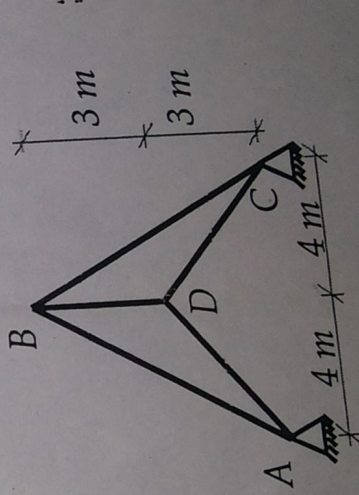
- What do you mean by a "primary structure" in force method of analysis?
- How many reactions do exist in a "smooth contact" surface? State the reasons to justify your answer.

Q#2: For the following structures, determine the degree of static and kinematic indeterminacy. Assume members are inextensible only in case of frame structures. (06 Marks)



Q#3: Solve the following structure using method of consistent deformation. (15 Marks)

A statically indeterminate truss, as shown in Figure 1, has two hinge supports. The temperature in two top-chord members (AB and BC) is assumed to be increased by 60°C . Determine the forces induced in each member of the truss. Cross-sectional area of all members, except vertical member BD, is 100 mm^2 . Cross-sectional area of member BD is 50 mm^2 . Use the value of Young's Modulus (E) = 200 GPa and coefficient of linear thermal expansion (α) = $12 \times 10^{-6}/^{\circ}\text{C}$.



(Figure 1)