

Roll No.

--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. (SE) (Sem.-2)

PLASTIC ANALYSIS AND DESIGN OF STEEL STRUCTURES

Subject Code : CE-506

Paper ID : [E0846]

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions.
2. ALL questions carry EQUAL marks.

- Q1 Give an example which illustrates the result of an economical design on the plastic theory. (20)
- Q2. a) Derive the relation between load factor and safety factor. (10)
- b) Write about the concept of plastic design. (10)
- Q3. a) Write in detail the assumptions made for structures subjected to bending only. (10)
- b) A fixed beam is subjected to a point load 'W' at $1/3$ from the one end. Compute ultimate deflection. (10)
- Q4. What are the secondary effects? Describe the rules for the design of sections using plastic theory subjected to the secondary effects. (20)
- Q5 a) A propped cantilever ABC is fixed at A and propped at B with an overhang BC. $AB=1$ and $BC=1/3$. The propped cantilever carries uniformly distributed load w , over entire span. Find collapse load intensity. Also locate the position of plastic hinge at collapse state. (10)
- b) Taking an example of simply supported beam loaded with UDL, explain the concept of application of linear programming to minimum weight design problems. (10)
- Q6 A portal frame is loaded as shown in fig. 1. Estimate the plastic moment for the frame. (20)

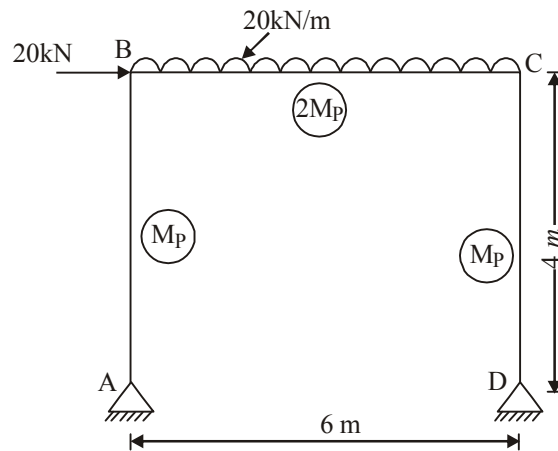


Figure - 1

- Q7 a) Write briefly a note on redistribution of moments. (8)
- b) Discuss the mechanism involved in the kinematic method of plastic analysis. For evaluating which parameters, you will use this method. A fixed beam subjected to UDL, acting throughout the span. Using mechanism method, compute ultimate load. (12)
- Q8. Write short notes on following :
- a) Local buckling and lateral buckling. (10)
- b) Special consideration for design of structures using light gauge metals. (10)