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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)**M.Tech I Year II Semester Regular Examinations October-2020****ADVANCED STEEL DESIGN**

(Structural Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)**UNIT-I**

- 1 A simply supported beam of span 6m is subjected to UDL of 20 KN/m. Design a steel beam by plastic design using a combined load factor of 1.7. **12M**

**OR**

- 2 a Explain about Idealized stress-strain curve for mild steel. **6M**  
b Explain fully plastic moment capacity. **6M**

**UNIT-II**

- 3 A hat of 100mm x 80mm x 5mm section with a 30 mm lip is to be used as concentrically loaded column of effective length 4.0 mm. Determine the allowable load. Take  $f_y = 235 \text{ N/mm}^2$  **12M**

**OR**

- 4 Design a hat section for a simply supported beam of effective span 2.5m. The superimposed load is 2KN/m. Yield strength of steel is  $f_y = 235 \text{ MPa}$ . **12M**

**UNIT-III**

- 5 a List out the various uses of steel towers. **6M**  
b List out the types of towers & Explain briefly. **6M**

**OR**

- 6 Briefly explain about the various structural configurations adopted in towers with neat diagrams. Also explain about the types of bearing systems adopted in towers. **12M**

**UNIT-IV**

- 7 Briefly explain the various steps involved in the design of roof trusses. **12M**

**OR**

- 8 Design a purlin section for the following data **12M**  
Spacing of roof trusses C/C = 5m  
Dead load of roofing = 0.5kN/m  
Live load on purlin = 1.1kN/m  
Wind load on Purlin = -1.5kN/m

**UNIT-V**

- 9 Design a steel roof truss shown in Figure 1 for a clear span of 12.0 m. the truss is **12M** supported over masonry columns 45 cm x 45 cm trusses are placed 3 m c/c and support galvanized iron sheet on rafters and steel purlins. The rise of the truss is 1/3 of span. The design wind pressure may be assumed to be  $1000\text{N/m}^2$

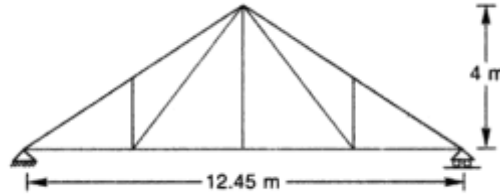


Figure 1

**OR**

- 10 Describe and design a simply supported gantry girder to for the following data: **12M**

Crane capacity : 160 KN

Self weight of crane girder : 200 KN

Self weight trolley, electric motor, hooks etc. : 50KN

Min. approach of crane hook to the gantry girder : 1.6 m

Wheel base : 2.8 m

c/c distance between gantry rail : 12 m

c/c distance between column : 6m

Self weight of rail section : 300 N/m

Check the section for maximum bending moment due to vertical forces, lateral forces and longitudinal forces.

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