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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year II Semester Supplementary Examinations July-2021**

**DESIGN & DRAWING OF STEEL STRUCTURES**

(Civil Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

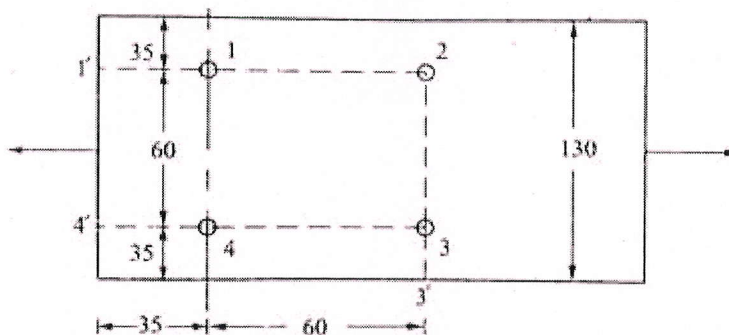
- 1 a Explain the various types of bolted connections with neat sketches. 7M  
 b A 18mm thick plate is joined to 16mm plate by 200 mm long(effective) butt weld. Determine the strength of joint if (i) A Double V butt weld is used. 5M

**OR**

- 2 a Explain advantages and disadvantages of steel structure 6M  
 b A double riveted double cover butt joint is used to connect plates 12mm thick. Using Unwin's formula, determine the diameter of river, rivet value, gauge and efficiency of joint. Adopt the following stresses:  
 Working stress in shear in power driven rivets = 100 N/mm<sup>2</sup> (mpa) 6M  
 Working stress in bearing in power driven rivets = 300 N/mm<sup>2</sup> (mpa)  
 For plates working stress in axial tension is 0.6fy  
 F<sub>y</sub>=260 N/mm<sup>2</sup> (mpa)

**UNIT-II**

- 3 Determine the Design strength of the plate 130mmX12mm with the holes for 16mm diameter bolts as shown in figure. Steel used to Fe 410 grade qualities.



12M

**OR**

- 4 Design a tension splice to connect two tension member plates of size 200×10 mm and 220×12 mm. the member is subjected to a factored tensile force of 280 KN. Use M20 grade 4.6 ordinary bolts for the connection. 12M

**UNIT-III**

- 5 Design a single angle strut connected to the gusset plate to carry 180 KN factored load. The length of the strut between center to center connections is 3m. 12M

OR

- 6 Determine the design axial load capacity of the column ISMB300@577 N/m, If the length of the column is 3m and its both ends pinned. 12M

**UNIT-IV**

- 7 Design a simply supported I-section to support the slab of hall 9m X 24m with beam spaced at 3m centre to centre. Thickness of slab is 100mm. Consider floor finish load 0.5 KN/m<sup>2</sup> and live load of 3 KN/m<sup>2</sup>. The grade of steel is E=250. Assume that adequate lateral support is provided to compression flange. 12M

OR

- 8 Design a simply supported I-section to support the slab of hall 9m X 24m with beam spaced at 3m centre to centre. Thickness of slab is 100mm. Consider floor finish load 0.5 KN/m<sup>2</sup> and live load of 3 KN/m<sup>2</sup>. The grade of steel is E=250. Assume that adequate lateral support is provided to compression flange for web buckling and web crippling, if stiff bearing is over a length of 75mm. 12M

**UNIT-V**

- 9 Explain Loads on roof trusses and also mention load combinations 12M

OR

- 10 Design angle purlin for the following data by simplified method:

Spacing of trusses=4m

Spacing of purlins=1.6m

Weight of A.C sheets including laps and fixtures=0.205kN/m<sup>2</sup>

Live load=0.6 kN/m<sup>2</sup>

Wind load=1 kN/m<sup>2</sup>

Inclination of main rafter of truss=21°

12M

\*\*\* END \*\*\*