

Code No: R32013

**R10**

**Set No. 1**

**III B.Tech II Semester Supplementary Examinations, Dec - 2015**  
**DESIGN & DRAWING OF STEEL STRUCTURES**  
**(Civil Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any ONE Question from Part – A**  
**and any THREE Questions from Part – B**

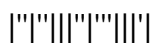
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**PART-A (30 M)**

- 1 A simply supported plate girder of 15m is subjected to a maximum factored moment of 4000 kN-m and a factored shear force of 600kN, using end stiffeners. Design the cross section of the girder and end bearing stiffeners. Check for bending moment. Draw the cross-section, longitudinal section including bearing stiffeners details to a suitable scale.
- 2 Design a gusseted base to carry an axial factored load of 3000kN. The column is ISHB 450@ 855N/m with two 250mm×20mm cover plates on either side. The effective height of column is 5m. The column is to rest on M20 concrete pedestal.

**PART-B (3x15=45M)**

- 3 a) Explain the various types of fillet welds with neat sketches.  
b) An ISA 65x65x10 carries a tensile load of 200 kN, applied along its centroidal axis. This angle is to be welded to a gusset plate. Find out the lengths of side fillet welds required at the heel and toe of the angle.
- 4 Design a compression member of two channels placed toe-to-toe. The length of the compression member is 10m and carries a load of 1200 kN. The width over the backs of channels is 450mm. The channels are connected by battens. Sketch the c/s of the column.
- 5 Design I-section purlin for an industrial building to support a galvanized corrugated iron sheet for the following data:  
Spacing of the trusses = 6m, Inclination of main rafter =  $30^{\circ}$ , spacing of purlin = 1.5m,  
Weight of corrugated sheeting =  $130 \text{ N/m}^2$ , live load  $0.6\text{kN/m}^2$ , wind load =  $1.8\text{kN/m}^2$   
and yield stress of steel = 250 Mpa.



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- 6 Design a simply supported gantry girder to carry an electric overhead travelling crane, given: (i) Span of gantry girder = 6.5m, (ii) Span of crane girder = 16m, (iii) Crane capacity = 250kN, (iv) Self weight of crane girder excluding trolley = 200kN, (v) Self weight of trolley = 50kN, (vi) Minimum hook approach = 1.0m, (vii) Distance between wheels = 3.5m and (viii) Self weight of rails = 0.3kN/m.
- 7 Design a built up column composed of two channel sections placed back to back, carrying on axial load of 1500 kN. The effective length of the column is 7 m. Also design a single Lacing system.

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