Exam. No. of the candidate: _____

GANPAT UNIVERSITY

B.Tech. Semester VI (CIVIL)

Regular Examination – May / June: 2012

C 601: Design of steel structure

Max.Time: 3 Hours **Max. Marks: 70**

Instructions: - (1) Answer to the two sections must be written in separate answer books.

(2) Figures to the right indicate full marks.

(3) Assume suitable data if required.

(4) IS: 875(III)-1987, IS: 800-2007 and Steel table is permitted.

Section – I

1 The beam section is ISMB 300 connected to the flange of column ISHB 300 using bolted connection. Design seat connection for it. End reaction of beam is 130kN.steel is of grade Fe 410 and bolts are of grade 4.6. **12**

2 Design a gantry girder to be used in an industrial building carrying a manually operated overhead travelling crane, for the following data: **23**

Crane capacity	200kN
Self-weight of the crane girder excluding trolley	180kN
Self-weight of the trolley, electric motor, hook etc.	45kN
Approximate minimum approach of the crane hook to the gantry girder	1.2m
Wheel base	3.0m
C/c distance between gantry rails	12m
C/c distance between columns (span of gantry girder)	8m
Self-weight of rail section	300N/m
Diameter of crane wheels	150mm

Steel is of grade Fe 410. Design also the field welded connection if required. The support bracket connection need not be designed

OR

2 (A) Draw typical layout of plate girder & Explain different element of plate girder with their function. **13**

2 (B) Give classification of steel bridge in detail. **10**

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Section – II

3 Design configuration for the roof truss & Calculate Dead load, Live load & Wind load per panel point in roof truss for the following data: **20**

Span of the truss (L)	: 14m
Spacing of the truss (C)	: 4m
Height of the truss	: 15m
Roof covering	: A.C.C Sheet @120N/m^2
Probable life	: 50 year
Permeability opening	: medium
Wall opening	: 10%
Location	: Ahmadabad

4 (A) Design an I-section purlin for an industrial building situated in the outskirts of Allahabad, to support a galvanized corrugated iron sheet roof for the following data: **15**

Spacing of truss c/c=5.0m
Span of truss=10.0m
Spacing of purlins c/c=1.5.0m
Intensity of wind pressure=2kN/m^2
Weight of galvanized sheets=130N/mm^2
Grade of steel-Fe410

OR

4 (A) Explain in Detail- "Types of failure in Beam" **7**

(B) An ISMB 450 @ 65.3 kg/m is used as a laterally supported beam. Check the beam for Bending strength, shear leg effect, web crippling & deflection. Max Bending moment in beam is 250kN·m & Maximum Shear force is 125 kN. Length of the beam is 8m.Beam carry u.d.l load throughout length. **8**

END OF PAPER

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