Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: 6th Civil Engineering

Regular Examination April - June 2015

2CI601 Design of Steel Structure

Time: 3 Hours / As per Scheme **Total Marks: 70**

Instruction: 1. Assume suitable data if necessary.
2. Mentioned codes are allowed. IS 800:2007, IS 875 Part-3, Steel Table or IS 808.

Section - I

Que. – 1 Design the Top Chord Member Having maximum length of 2.1 m and which is having tension force of 201 kN and compression force of 108 kN. **12**

OR

Que. – 1 Design the connection for main tie Member Having maximum length of 4 m and which is having tension force of 175kN and compression force of 69 kN. **12**

Que. – 2 Design the Channel purlin for the Howe type of the truss which having a span of 14 m, and height of 8 m, and spacing of truss is 4 m the wind force on the truss is 0.985kN/m^2. **11**

OR

Que. – 2 An ISMB 500 section is used as a beam over a span of 6 m, with simply supported ends. Determine the maximum factored uniformly distributed load that the beam can carry if the ends are restrained against torsion but compression flange is laterally unsupported. **11**

Que. – 3 **Explain Any Two.** **12**

A How to calculate a wind pressure on roof?

B Draw a suitable truss and define its member in brief.

C Give the Effective length of the beam which having continuous length with partially torsional restrained and what are the deference between normal condition and destabilizing condition?

Section – II

Que. – 4 A A built-up column 2ISMC 350 at back to back spacing of 220 mm is carrying an axial load of 1100 KN. length of column is 10 m .it is held in position at both end but not restrained in direction. Design double lacing system **6**

B Design a slab base foundation for a column ISHB 350 to carry a axial load of 1200 KN. Assume FE- 410 and M25.take SBC=200KN/M^2. **6**

OR

Que. – 4 A A built-up column 2ISMC 300 at back to back spacing of 200 mm is carrying an axial load of 1500 KN. length of column is 10 m .it is held in position at both end but not restrained in direction Design double lacing system . **6**

B Design a slab base foundation for a column 2 ISHB 300 to carry a axial load of 1200 KN.Assume FE 410 and M25.take SBC=200KN/M^2 **6**

Que. – 5 A Design a plate girder of effective span of 30 m and carrying UDL of 30 kN/m and two Concentrated load of 150 kN each of them acting 10 m from both ends. The girder is simply supported at the ends **6**

B A column in a building frame is subjected to factored load 500 kn. at an eccentricity of 120 mm from major axis. Design the column. consider length of column is 4 m. **5**

OR

Que. – 5 A Design a plate girder of effective span of 30 m and carrying udl of 40kN/m and two Concentrated load of 180 kN each acting of 10 m from both ends. The girder is simply supported at the ends Supported at the ends. 6

B Explain horizontal and vertical stiffeners. 5

Que. – 6 A Design a hand operated overhead crane, which is provided in a shed, and the details are: 12

Capacity of crane = 50 kN
Longitudinal spacing of column = 6m
Center to center distance of gantry girder = 12m
Wheel spacing = 3m
Edge distance = 1m
Weight of crane girder = 40
Weight of trolley car = 10 kN

END OF PAPER