Roll No…….. **Total No. of Printed Pages: 1**

Total No. of Questions: [09]

B. Tech. (Civil Engineering)(Semester – 5th)

DESIGN OF STEEL STRUCTURES-1

Subject Code: BCIES1524

Paper ID: [19110719]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Define the following:

(a) Define Rivet Value and its importance.
(b) Differentiate between rolled steel sections and built up steel sections.
(c) What do you mean by block shear failure?
(d) Differentiate between lacing and battening used in compression members.
(e) What are the laterally restrained beams?
(f) Enlist types of column bases.
(g) Differentiate between top chord member and bottom chord member.
(h) Define throat thickness in weld.
(i) How buckling is important in compression members?
(j) Define term "Black Bolts".

Section – B **(5 marks each)**

Q2. Write the Specifications for Welded connection in detail.

Q3. Find the ultimate design load of ISA (125x125x10) in tension which is connected to gusset plate 10mm thick with the help of single line rivets. The yield and ultimate strength of steel are 250MPa and 410Mpa respectively.

Q4. Determine the design compressive strength of ISHB 200@392.40N/m column having 4.8 m length with both ends are fixed.

Q5. Design a fillet weld to join a tension member consisting of 2 ISA 100 x 75 x 8 mm to a 12 mm thick gusset plate. The factored tensile load is 410 kN.

Q6. Explain why classification of steel cross sections is needed as per Indian Standard.

Section – C **(10 marks each)**

Q7. Design a laterally supported beam of effective span 5.0 m for maximum bending moment and shear force of 110kNm and 150kN respectively. Assume grade of steel as Fe 410.

Q8. Write design steps for grillage foundation with the help of sketch.

Q9. Design a steel slab base for a column ISHB350 @ 710 N/m subjected to factored axial compressive load of 1600 KN. The base slab rests on concrete pedestal of grade 20. Assume missing data if any.