B.Tech. 5th Semester (Civil Engg.) XI Examination

December–2013

DESIGN OF STEEL STRUCTURE-I

Paper–CE-301-F

Time allowed : 3 hours] *[Maximum marks :100*

Note :Attempt five questions in all, selecting one question from each part. Q.N. 1 is Compulsory. Attempt any eight parts of Q. 1.

1. (a) Define the properties of steel.

(b) Explain various types of connections.

(c) State and explain types of tension members.

(c) What is slenderness ratio ?

(e) Define various types of column bases.

(f) What is Web crippling ?

(g) Define diagonal buckling.

(h) What is lacing and battens ?

(i) What is necessity of stiffners in plate girder ?

(j) Define web and flange splices. 2.5×8=20

Part-A

2. (a) Explain the advantages and disadvantages of steel structures. 10

(b) What are the design considerations to be adopted while designing a steel structure ? 10

3. Two plates 10 mm and 18 mm thick are to be joined by a double cover butt joint. Assuming cover plates of 6 mm thickness. Evaluate the joint strength and calculate its efficiency. Using M20 botts of grade 4.6 and Fe 410 plates. Assume a pitch of 60 mm and edge distance of 40mm. 20

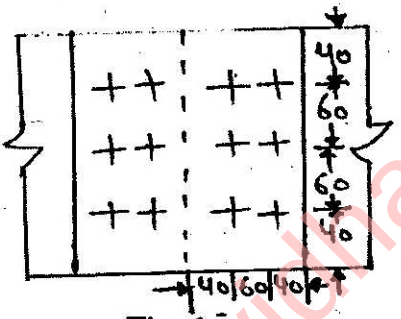

Fig. 1

Part - B

4. Calculate the load that can be transmitted through the eccentric welded connection shown in fig. below. Weld size = 6 mm. 20

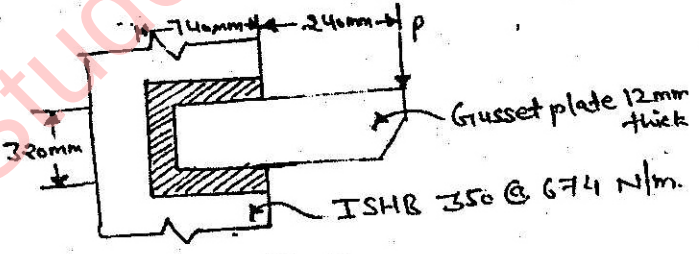

Fig. 2

5. (a) What is lug angle and why it is not preferred ? Explain. 10

(b) Design a single angle tension member to carry a design tensile load of 400 kN. Gusset plate is of 8mm thickness. Adopt 20 mm dia. Black bolts for connections. 10

Part-C

6. (a) Explain the behaviour of compression member. 10

(b) Design a single angle section for a discontinuous strut to carry a load of 100 kN. The length of the member is 2.5m. 10

7. (a) State and explain the general design criteria for beams. 10

(b) Write short notes on

(i) Web buckling. (ii) Web Crippling

(iii) Diagonal buckling. 10

Section-D

8. (a) Explain various elements of plate girder. 10

(b) Write the design steps of a plate girder. 10

9. (a) What is the necessity of stiffeners in plate girder? Explain various types of stiffners. 10

(b) Define the curtailment of flange plates. 10