

FACULTY OF ENGINEERING**B.E. 3/4 (Civil) II – Semester (New) (Main) Examination, April / May 2013****Subject : Steel Structures****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

1. Define strength of bolt. 2
2. Explain with a neat sketch the failure of bolt in double shear. 3
3. Define plastic neutral axis and plastic moment. 2
4. Explain theory of plastic analysis. 3
5. Maximum value of limiting width to thickness ratio of element of ISHB450@907.4 N/m is _____ 2
6. Write briefly about the classification of cross-sections. 3
7. What are tension members? Where they are used? 2
8. Write about economical spacing of trusses. 3
9. Slenderness ratio of compression members. 2
10. Briefly explain the design of tension members with working stress method of design as per IS 800-2007. 3

PART – B (50 Marks)

11. Two plates of 160mm x 12 mm are to be connected together through a lap joint to resist a force (factored) of 200 KN. Design the joint using M18 bolts of 4.6 grade. 10
12. Design a laterally unsupported beam of span 5.60 M subjected to a load of 45 KN/m. Assume the ends to be simply supported. 10
13. Design a simple angle strut of a roof truss to carry a load of 85 KN. The length of the strut is 2.20 m between the ends connections made with two bolts. Consider the strut loaded through one leg. 10
14. A tension member ISA 100 x 75 x 8mm is connected to a 10 mm thick course plate the longer leg is connected to the plate 4 Nos. of M20 bolts of 4.6 grade. Find the load the member can carry. 10
15. Design a splice to connect two Nos. ISHB 400@806.40 N/m. the column carries a factored load of 800 KN and a factored moment of 40 KN.m. Show details through a neat sketch. 10
16. Design a welded connection (shop welding) for a tie of a roof truss consists of 2 Nos. ISA 125 x 95 x 10 mm. The angles are connected to either side of a 10 mm thick gusset plate. The tie carries a factored load of 460 KN. 10
17. Write short notes on the following :
 - a) Block shear
 - b) Theory of plastic design
 - c) Explain how limit state method differs from working stress method.
