

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- April 2018

B-Tech VIth Semester

COURSE CODE: 10B11CE611

MAX. MARKS: 25

COURSE NAME: Design of Steel Structures

COURSE CREDITS: 4

MAX. TIME: 1.5 Hrs

**Note: (i) All questions are compulsory.**

**(ii) Carrying of mobile phone during examinations will be treated as case of unfair means.**

**(iii) IS-800:2000 and IS-808:1989 are allowed. (Sharing of codes is strictly prohibited)**

**Course Objectives**

CO-1 Design bolted and welded connections

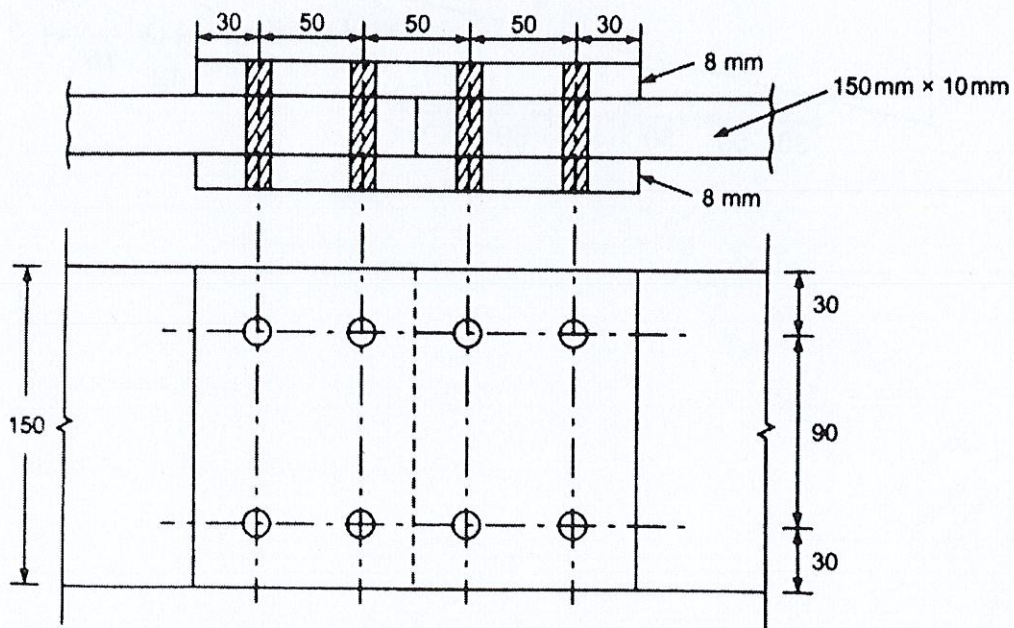
CO-2 Design tension and compression members.

CO-3 Design beams and beam columns

CO-4 Design built up members and column base

CO-5 Design of Plate Girder

**Q1.** Find the Efficiency of the Butt joint as shown in figure below. Bolts are of 16 mm diameter of grade 4.6 , Cover plates are 8 mm thick. Each plate is of grade 410. **CO-1 [6 Marks]**



**Q2.** A tie member of roof truss consists of two **ISA 100x75x8 mm**. The angles are connected to either side of a 10 mm thick gusset plate and member is subjected to a factored pull of 450 kN. Design a welded connection (shop welded) **CO-1,CO-2 [6 Marks]**

**Q3.** Determine the *Design Axial load* on the column section **ISMB 450 @ 710.3 N/m** , height of the column is 4 meter and is pin ended. Assume that  $f_y = 250 \text{ MPa}$ ,  $f_u = 410 \text{ MPa}$  and  $E = 200000 \text{ MPa}$ . **CO-2 [6 Marks]**

**Q4.** A single unequal angle **ISA 100x75x8 mm** is connected to a 12 mm thick gusset plate at the ends with 6 numbers of 20 mm diameter bolts to transfer tension as shown in figure. Determine the design tensile strength of the angle if gusset plate is connected to the 100 mm leg.  $f_y = 250 \text{ MPa}$ ,  $f_u = 410 \text{ MPa}$  **CO-2 [7 Marks]**

