

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION-2017

M.Tech 2nd Semester

COURSE CODE:12M1WCE212
 COURSE NAME: Design of Steel Structures

MAX. MARKS: 25

COURSE CREDITS: 3

MAX. TIME: 1 HR 30 MINS

Note: All questions are compulsory. Carrying mobile phone during examinations will be treated as case of unfair means. Illustrate your answers with neat sketches wherever necessary. Preferably, write the answers in sequential order. IS 800 and IS 808 are allowed.

Q.1 A bracing consisting of 2-ISA 125 X 75 X 10 is connected to the flange of the column ISHB 400 through 16 mm thick gusset plate as shown in **Fig # 1**. Design the bracing connection using 18 mm diameter black bolts of grade 4.6 when the bracing carries a tensile force of 400kN at an angle 45° with the horizontal. All the rolled steel sections are of Fe410 grade steel.

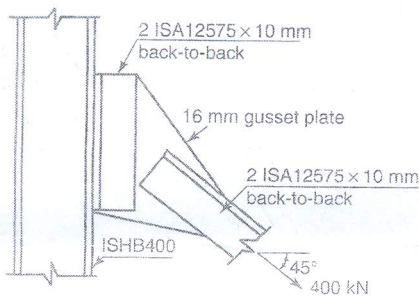


Fig # 1

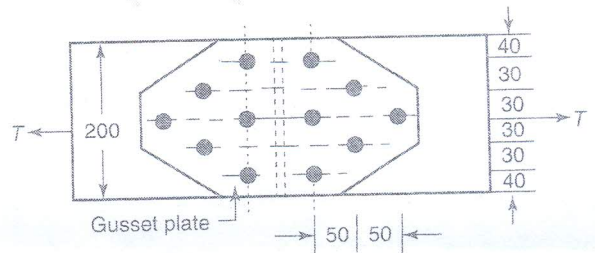


Fig # 2

Q.2 Two 200 X 12 mm flat plates are connected through 16 mm thick gusset plate on either side of the plates as shown in the **Fig # 2**. The plates used are of Fe410 grade steel. 20 mm diameter bolts of grade 4.6 are used in the connection. Determine the design tensile strength of the plate members.

Q.3 The cross section of a column in a building consists of four ISA 110 X 110 X 12 mm angles placed with their backs 360 mm apart as shown in **Fig # 3**. The angles are connected with a single laced system consisting of 60 X 10 mm flat bars inclined to the axis of the column at an angle of 45°. If the effective length of the column is 8.5 m; determine its load carrying capacity. Grade of structural steel is Fe410.

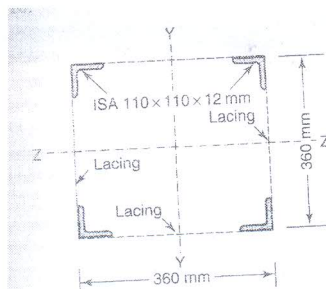


Fig # 3