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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- April 2019

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)*

Q1. 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*, *CO-3*** [6 Marks]

Q2. 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 MPa, f_u = 410 MPa and E = 200000 MPa.   ***CO-4*** [5 Marks]

Q3. 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 MPa, f_u = 410 MPa.   ***CO-1*, *CO-3*** [7 Marks]
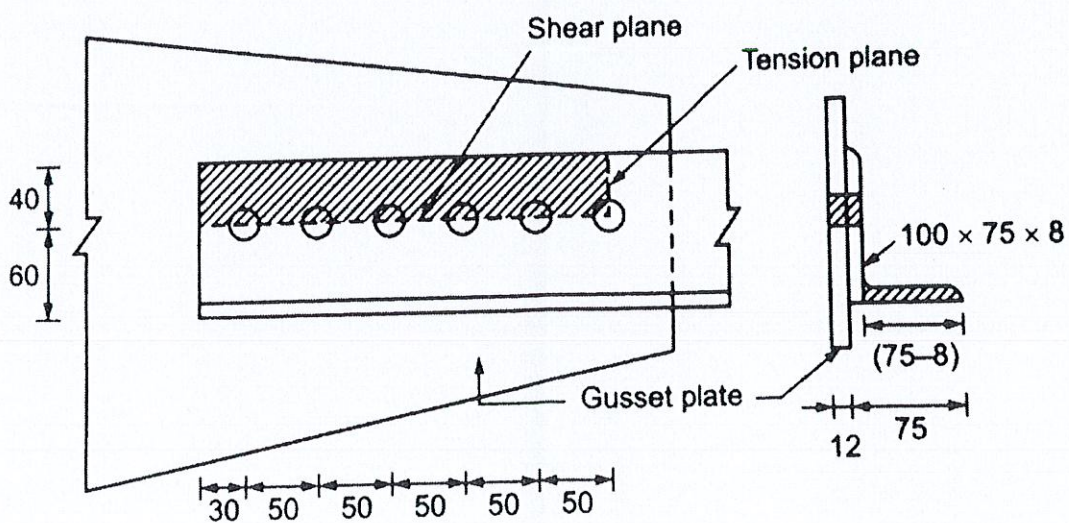
Q4. Given below is a figure of a simply supported 2-D truss, a service load 320 KN is acting at the point **C**. Members at each joint are connected on gusset plates of thickness 10 mm and **M18** bolts of grade 6.4 such that shear plane in bolts passes through shank only. Joints can be treated as rigid, if number of bolts between a member and gusset plate exceeds one. Design member **CF**, with an equal angle section and take a case of tension only.

[*Hint: Find member forces by truss analysis*]   **CO-1, CO-2, CO-3 [7 Marks]**