KATHMANDU UNIVERSITY
End Semester Examination [C]
December, 2024

Level : B.ARCH
Year : III
Time : 2 hrs. 30mins.

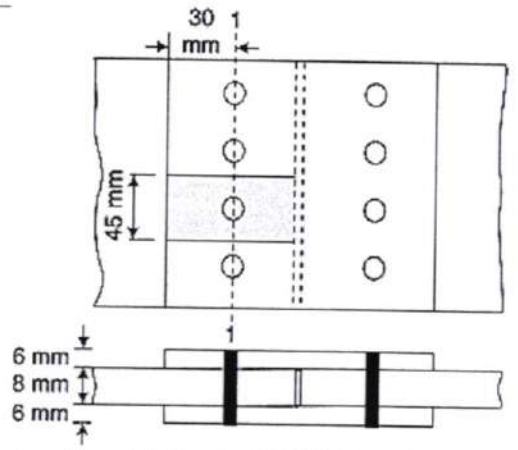
24 DEC 2024

Course : CIEG 341
Semester : II
F. M. : 40

Make a suitable assumptions if necessary.
Use of code IS 800:2007 ,808: 1989/ IS Handbook No. 1 & IS 883:1994 is allowed.

SECTION "B"
[40 marks]

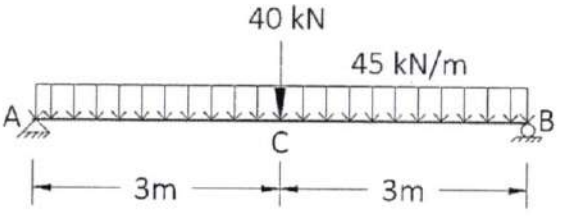
1. A single-bolted double-cover butt joint is used to connect two plates of grade Fe410 which are 8 mm thick. Assuming 16 mm diameter bolts of ultimate stress 400 MPa and cover plates to be 6 mm thick, calculate the strength and efficiency of the joint, if 4 bolts are provided in the bolt line at a pitch of 45 mm as shown in Figure. [6]



2. Design a bridge truss diagonal subjected to a factored tensile load of 300 kN using angle section. The length of the diagonal is 3.0 m. The tension member is connected to a gusset plate 16 mm thick with one line of 20 mm diameter bolt of ultimate stress 800 MPa. Assume Fe410 grade steel. [7]

3. Design a built-up cross section for a 8m long laced column with two channels placed back to back for supporting a factored axial load of 1800 kN. The column is to be effectively held in position at both ends and restrained against rotation at one end. The grade of structural steel is Fe410. [10]

4. A simply supported beam *AB* of span 6m consist of a uniformly distributed load of 45 kN/m over the entire span and a concentrated load of 40 kN at mid span as shown in figure below. Using steel with f_y= 250 *MPa*, select a rolled I-section for the beam. The loads given are service loads. Lateral bracing is provided by a concrete slab. Check for deflection of beam also. [7]



5. A timber column supports an axial load of 800kN. The effective length of the column is 3m. Taking the column to be of Sal wood, design the column as a built-up section. [5]

6. Write short notes on: [2.5+2.5]
   a. In-plane and out-of-plane behavior of masonry wall
   b. Permissible stress for masonry wall