B.E. Civil Engineering (Model Curriculum) Semester - VI
PCC-CE605 - Design of Steel Structures

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Notes : 1. All questions carry equal marks.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and Chemical equation should be given wherever necessary.
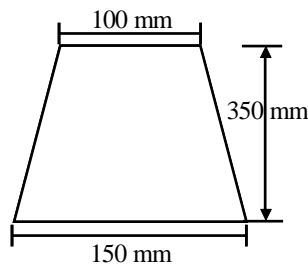5. Illustrate your answers wherever necessary with the help of neat sketches.

1. Two plate of 200x12mm are to be connected by double coven butt joint with 20mm dia. **13**
bolts. The factored tensile load on the plane is 500 kN. Design bolted connection. Find
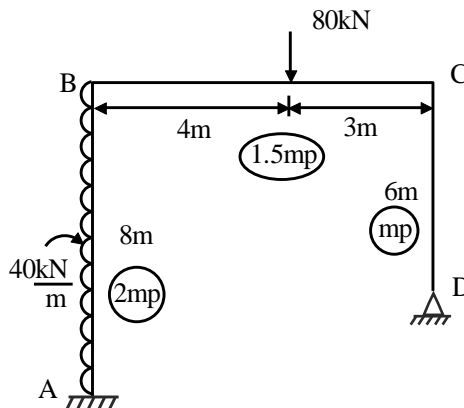efficiency of joints. Sketch the structural details.
Use : IS 800-2007.

OR

2. Design a discontinuous strut using two angles of same side of gusset plate, to carry a load **13**
of 35 kN. The length of the member between centre to centre of intersection is 2.70m.
Assume f_y = 250 MPa for the member as design above. What will be the load carrying
capacity if the angle are placed on the opposite side of gusset plate. Use IS : 800

3. Design a tie member of roof truss subjected to a factored load of 300 kN and use double **14**
angle section connected to same side of 12mm thick using 20mmϕ . (PDSR) rivets.

OR

4. Find the shape factor for the following cross-section. **14**
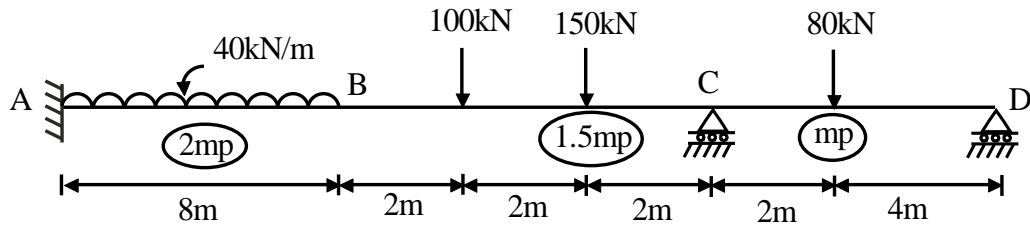

5. Find collapse load factor for the following frame. **13**

OR

6. Find the required value of plastic moment capacity in continuous beam as shown in fig. **13**
The loads shown in fig are collapse loads.

7. Design a welded plate girder laterally supported on 12m effective span carrying a moving **20**
UDL of intensity 30 kN/m on whole span fy = 250 MPa. Support width = 300mm sketch
structural details.

OR

8. Design a 8m long buit up laced column to carry a factored axial load of 1250 kN. The **20**
column is restrained in position but not in direction at each end provide lacing system
making connection with 16mm ϕ bolt. The column shall consist of two channel place face
to face at a suitable spacing.

9. Design a slab base plate for a column carrying axial load of 1000 kN. And Bm of 200 kN.m **20**
Use M20 grade of concrete for base plate & Fe 415. Steel use ISHB 350 Use cleat angle of
150x150x15.

OR

10. A beam ISMB 400@ 616 N/m transfer 120 kN. End reaction and 50 kN.m end moment to **20**
flange of ISHB 350@ 674 N/m. Design suitable beam-column connection using 22mm ϕ
PDFR fy = 250 MPa
r = 1.5 sketch structural details.

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