Total No. of Questions :8] *[Total No. of Printed Pages : 4*

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CE-605

B.E. VI Semester

Examination, June 2017

Structural Design and Drawing-II

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) Assume suitable data if missing.

iii) All questions carry equal marks.

iv) Use of relevant IS code is permitted.

1. a) A Tie member Consists of a roof truss consists of 2 ISA 10075, 8mm. the angles are connected to the either side of a 10mm gusset plates and the members is subjected to working pull of 300kN. Design the welded connection. Assume connections are made in the Workshop.

   b) Two plates 10 mm and 18 mm thick are to be joined by a double cover butt joint. Assuming cover plates of 6 mm thickness. Evaluate the Bolt value, joint strength and calculate its efficiency. Using M20 bolts of grade 4.6

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and Fe 410 plates. Assuming a pitch of 60 mm and edge distance of 40 mm. Details given in Figure-1.

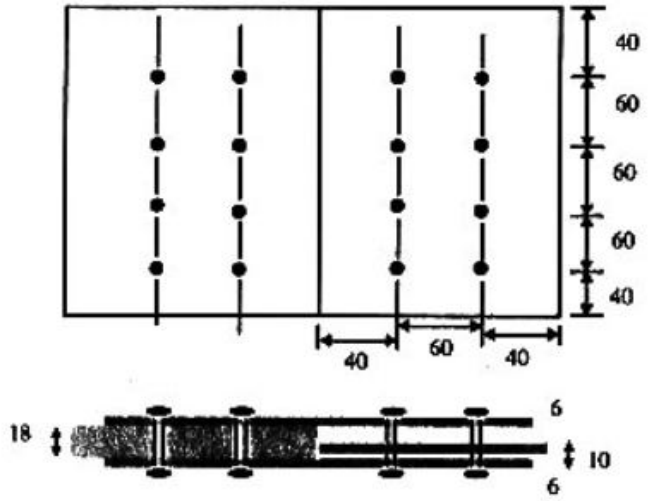

Figure-1

2. Design a double angle Tension member connected on either side of a 10 mm thick gussets plate to carry an axial factored load of 1000kN. Design also connections (assume shop connection).

3. Design a double angle discontinuous strut to carry a factored load of 180kN. The length of the strut is 3m between intersections. The two angles are placed back to back. Consider

   i) Angles are placed on opposite side of gusset plate

   ii) Angles are placed on the same side of the gusset plate.

   Assume design compressive stress 100 MPa.

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4. Design a Simply supported beam (assume laterally unsupported) of span 6.0 meter carries uniformly distributed load of 45kN/m (dead load) and 120kN imposed load. In addition the beam carries a point load at mid span of 45kN dead load and 50kN imposed load. Assume grade of steel as Fe410.

5. Design a Plate Girder required to carry a factored shear of 1800kN. Assuming that tension field is not utilized in the design. Also determine whether intermediate stiffeners are necessary? Assume $f_y = 250$ MPa.

6. a) Design the base plate for a column subjected to a factored moment of 45kN-m and a factored axial load of 550kN. Column having a size ISHB 250. The cube compressive strength of concrete is 25Mpa. Use grade of steel is Fe410.

   b) Design a column section (non sway) in a building frame with flexible joints. Factored column load axially is 600kN and have a height 4 meter. Factored design moment at top of column is 30kN-m and at bottom of the column is 50kN-m. Take the effective length of column is 0.8 L along both the axes. Assuming $f_y = 250$ Mpa.

7. a) List the items that are to be considered while planning and designing an Industrial building.

   b) What are the different types of bracings used in braced building?

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a) What do you understand by Industrial building frame? Sketch various components of Industrial building frames.

b) Define : Purlins, Girts, Eave and Bay.

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