R16

Reg. No:

Time: 3 hours   Max. Marks: 60


PART-A
(Answer any one) (1 x 24 = 24M)

1. Design a built up column of length 9m carrying an axial factored load of 1800kN. The column may be restrained in position but not in direction at both ends. Design battens instead of lacing system.

2. Design a steel beam section for supporting roof of a big hall for the following data and apply the usual checks. Assume steel of grade Fe410.

   Clear span = 6.0m; End bearings = 150mm;   c/c spacing of beams = 3.0m; Imposed load on the beam = 12 kN/m^2; Dead load (Inclusive of self weight) = 4 kN/m^2; Restriction on beam depth = 400mm. The compression flange of the beam is laterally supported throughout. Draw the Sectional elevation.

PART-B
(Answer any Three) (3 x 12 = 36M)

3. Determine the Design strength of the plate 140mm x 12mm with the holes for 20mm diameter bolts as shown in figure. Assume steel of grade Fe 410.
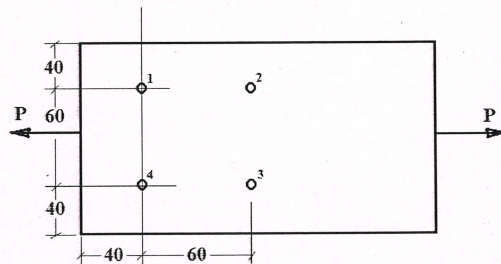
4. a) Explain various types of failures of riveted joints.   4M

   b) Design a suitable longitudinal fillet weld to connect two plates as shown in figure to transmit a pull equal to full strength of the small plate. Both the plates are of 10mm thick. Grade of steel Fe410. Assume shop weld.   8M
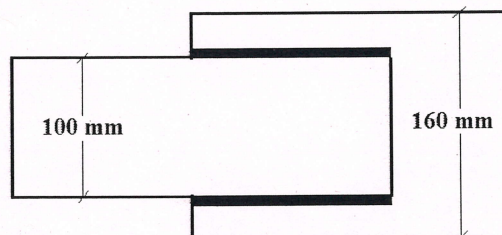
5. A column section ISHB 300 @ 577 N/m is carrying a factored load of 600 kN. A factored moment of 30 kN.m and factored shear force of 60 kN. Design a suitable column splice. Assume ends are milled.

6. A simply supported steel joist of 4.0m effective span is laterally supported throughout. It carries a total uniformly distributed load of 40 kN (inclusive of self weight). Design an appropriate section using steel of grade Fe410.

7. A power plant structures having maximum dimension more than 60m is proposed to be built on downhill side near Dehradun. The height of the hill is 400m with a slope of 1 in 3. If the location is 250m from the crest of the hill on downward slope, and its eve board is at a height of 9m, determine the design wind pressure.

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