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Code.No: R05320103 | R05 | SET-1

III B.TECH – II SEM EXAMINATIONS, DECEMBER - 2010
BASIC STRUCTURAL STEEL DESIGN AND DRAWING
(CIVIL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any ONE question from PART - A
Answer any THREE questions from PART - B
- - -

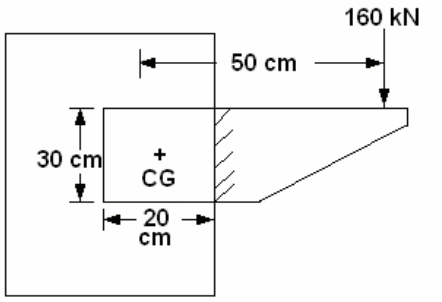
Part – A **(1 x 32 = 32)**

1. Design a web splice for a plate girder for the following data:
Web plate: 2000 mm x 12 mm
Flange angles: ISA 200 mm x 100 mm x 15 mm (ISA 200 100, @0.336 kN/m)
Net area of tension flange: 24642 mm^2.
Gross area of compression flange: 28556 mm^2.
Maximum bending moment at section: 6900kN-m.
Corresponding shear force at section: 1380 kN
Flange plates in each flange: 2 x 500 mm x 16 mm. [32]

2. A 12 m span welded plate girder is subjected to a uniformly distributed load of 30 kN/m along with a concentrated load of 150 kN at 4 m from one of the supports. Design
   a) The cross-section of the plate girder assuming the web to be 6 mm thick.
   b) The welded joint for connecting the flange plates with the web.
   c) The web stiffeners including the bearing stiffeners at supports.
   Draw to scale:
      i) Cross section of plate girder.
      ii) Longitudinal elevation. [32]

Part – B **(3 x 16 = 48)**

3.a) Explain the advantages and disadvantages of welded connections?
b) Calculate the size of weld required for the welded bracket as shown in the figure? [16]



4.a) What is a strut? Explain continuous and discontinuous compression members?
b) Calculate the safe load carrying capacity of a single angle discontinuous strut ISA 150mm x 150mm x 12mm section? [16]

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5.a) Explain the I.S codal specifications for permissible tensile stresses.

b) Design a single angle section for a tension member of a roof truss to carry a pull of 150 kN. The member is subjected to a possible reversal of stress due to wind. The length of the member from centre to centre of intersection is 3.50m. [6+10]

6. A 10m x 40m godown is to be constructed. The steel roof trusses will be used for roofing. The trusses will be supported over masonry walls 300mm thick. Galvanised corrugated iron sheets will be used for covering. Propose a suitable type of roof truss. The basic wind presssure is 1.04 kN/m^2 and there is no snowfall. Determine the load at each point. [16]

7. Design the central section of a plate girder for an effective span of 20m. if the dead and live loads amount to 30 kN/m and 60 kN/m, respectively. Show the curtailment of flanges on a diagram. [16]

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