

Code No: 136BB

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, November/December - 2020

DESIGN OF STEEL STRUCTURES

(Common to CE, CEE)

Time: 2 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

Note: IS 800-2007 code book and steel tables are permitted.

1. A tie member of a roof truss consists of 2 ISA 100×75×8 mm. The angles are connected on either side of a 10mm gusset plates and the member is subjected to a working pull of 400kN. Design the welded connection. Connections are made in the workshop. [15]
- 2.a) List the advantages and disadvantages of bolted connections.
b) How will you calculate strength and efficiency of a bolted joint? [8+7]
3. Design a built-up column 7m long to carry factored axial load of 1000 kN. The column is restrained in position but not in direction at both the ends. Design the column with two channels placed toe-to-toe. Provide single lacing system with 20mm diameter bolted connection. Assume steel of grade Fe 410 and bolts of grade 4.6. [15]
4. Design a single angle section for a tension member of a roof truss to carry a factored tensile force of 250kN. The member is subjected to the possible reversal of stress due to the action of wind. The length of the member is 3m. Use 20mm shop bolts of grade 4.6 for the connection. [15]
5. A compound beam is to carry a uniformly distributed dead load of 300kN and an imposed load of 500kN. The beam is simply supported over a span of 12meters. Allow 30kN for the weight of the beam. The overall depth should not exceed 700mm. The bearing plate width is 300mm and full lateral support is provided for Compression flange. Design the beam. [15]
6. An ISLB 350 @495 N/m transmits an end reaction of 350KN to the web of an ISMB500 @869N/m. Design a framed connection and give neat sketch. [15]
7. List the steps involved in the design of a roof truss clearly. [15]
8. List the steps involved in the design of plate girders with stiffeners. [15]

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