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Anna University Exams April / May 2019 – Regulation 2013
Rejinpaul.com Unique Important Questions – 6th Semester BE/BTECH
CE6603 Design of Steel Structures

Unit I

1. Estimate the dimensions of a doubly bolted lap joint for plates 16mm thick to carry its full load. Take permissible axial tension in plate 150N/mm^2
2. A tie member 75 mm X 8mm is to transmit a load of 90 kN. What is the length of the fillet weld and calculate the necessary overlap.
3. Design a double bolted lap joint for a plate of 20mm thickness to carry its full load. a. If the bolts are bearing type b. If the bolts are friction grip type bolts
4. Design a lap joint between the two plates each of width 120mm, if the thickness of one plate is 16 mm and the other is 12 mm. The joint has to transfer a design load of 160kN. The plates are of Fe 410 grade. Use bearing type plates
5. A tie member of a roof truss consists of 2 ISA 90 mm X 60 mm X 8 mm. The angles are connected on either side of 12 mm gusset plate and the member is subjected to a pull of 375kN. Design the welded connection

Unit II

1. Design the tensile strength of a roof truss diagonal 100x75x8 mm connected to the gusset plate by 5mm welds.
2. Find the suitable design for a single angle section for a tension member of a roof truss to carry a factored tensile force of 225KN. 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
3. Illustrate lug angle with neat sketch and give its uses also
4. Determine the tensile capacity of the sections a) Angles are placed on the opposite side of gusset plates b) Angles are placed on the same side of gusset plates
5. Design a splice to connect a 300mmx20mm plate with 300mmx10mm plate to carry design load of 500 kn. Use 20 mm black bolts
6. Identify the suitable design for a tension splice for a tension member sections 160mm x 10mm and 250mm x 12 mm. The member is subjected to a pull of 200 KN

Unit III

1. Explain the step by step procedure for finding the load carrying capacity of a compression member
2. Illustrate in detail about column splice and mention its purpose
3. Find the suitable design for a rolled steel beam section column to carry an axial load 1100 kN. The column is 4 m long and adequately in position but not in direction at both ends
4. Describe about laced column and also explain its design and specifications.
5. Design a suitable slab base for a column section ISHB 400@ 822 N/m. Supporting an axial load 500kN. The base plate is to rest on a concrete pedestal of M20 grade concrete
6. Calculate the compressive resistance of a compound column consisting ISMB 500 with one cover plate 350 x 20 mm on each flange and having a length of 5 m. Assume that the bottom of column is fixed and top is rotation fixed, translation free.

Unit IV

1. Analyse the expression for the economical depth of the plate girder.
2. Design a bearing stiffener for a welded plate girder with the following specifications. Web = 1000mm X 6mm thick. Flanges = 2 Nos. of 350X20mm plate on each side. Support reaction = 350kN. Width of the support = 300mm
3. A simply supported beam of span 3.25m consists of rolled steel section ISLB 325 @ 422.8 N/m. Determine the design bending strength of the beam, if the beam is laterally unsupported.

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4. Design a laterally restrained simply supported beam to carry a uniformly distributed load of 44 kN/m. The effective span of the beam is 8 m. A bearing length of 75 mm is provided at the supports
5. Design rolled steel I section for a simply supported beam with a clear span of 6 m. It carries a UDL 50 kN/m excluding self weight of the girder. The beam is laterally supported.

Unit V

1. A roof truss- shed is to be built Jodhpur city area for an industrial use. Determine the basic wind pressure .The use of shed 18 m x 30 m
2. Discuss briefly the following with neat sketches. i) bracing system in roof truss ii) Connection of purlin to rafter iii) Anchorages of truss with concrete column
3. Write down the step by step procedure of design of gantry girder
4. List out various elements of the roof truss and mark all its significance
5. A Power house building 25m high is to be designed in Darbhanga city. Compute the basic wind pressure.

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