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6th Sem / Civil, Brick Tech., Constr. Mgmt.
Subject:- Steel Structures Design and Drawing

Time : 6Hrs. M.M. : 150

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 For the same depth of member the heavier section is (CO1)
a) ISWB b) ISMB
c) ISLB d) ISHB

Q.2 As per the online formula nominal denominator d is equal to (CO2)
a) 6Öd b) 6ÖD
c) 6Öt d) 6ÖP

Q.3 The minimum size of fillet weld is (CO3)
a) 5 mm b) 2 mm
c) 3 mm d) 1 mm

Q.4 The unit of slenderness ratio is (CO4)
a) N/mm b) mm
c) mm^2 d) No unit

Q.5 Tie member is a (CO5)
a) Torsion member b) Tension member
c) Compression member d) Flexible member

Q.6 The Ratio of rise to full span is (CO6)
a) Slope b) Pitch
c) Span d) Panel

Q.7 Roof trusses are economical for span (CO6)
a) greater than 3 mm b) greater than 10mm
c) greater than 6 mm d) None of the above

Q.8 The most economical section for a column is (CO8)
a) Tubular section b) Angle section
c) I-section d) Round bars

Q.9 Unit of radius of gyration is (CO9)
a) mm b) mm^2
c) mm^3 d) mm^4

Q.10 The metal added to the joint while welding is called as (CO3)
a) Weld metal b) Fillet metal
c) Filler d) All of the above

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 The number of categories for rolled steel beams are _____ (CO1)

Q.12 Centre of Centre distance of rivet is called_____ (CO2)

Q.13 Bolted joints are of_____ types (CO3)

Q.14 Member subjected to direct tension are called _____ (CO4)

Q.15 Unit of radius of gyration is_____ (CO5)

Q.16 The ratio of rise to full span is called_____ of roof trusses. (CO6)

Q.17 Long column fail due to _____ (CO7)

Q.18 Web crippling is also known as _____ (CO8)

Q.19 Wrought iron is best suitable to resist _____ stresses. (CO9)

Q.20 Modulus of rupture for M15 grade of concrete is _____ (CO10)

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define rivets and its type. According to the shape of their heads? (CO2)

Q.22 Explain advantage and disadvantage of welded joints. (CO3)

Q.23 Explain how to calculate strength of a butt weld joint? (CO4)

Q.24 What are the various types of sections used as tension member? (CO5)

Q.25 Calculate the safe load for a beam fillet welded joint with effective length of 150mm.
The grade of steel is 410N/mm^2 and ultimate strength of metal is 250 N/mm^2.
Take V_{mw} for shop welding= 1.2 (CO5)

Q.26 Explain different elements of Steel truss? (CO6)

Q.27 Write down the steps in design of torsion member. (CO6)

Q.28 Explain the use of roof trusses. (CO7)

Q.29 Calculate moment of resistance of steel beam ISLB 300 at 350 N/m and take persmissible stress in bending is 165 N/mm^2 (CO5)

Q.30 Explain single angle and Double angle strut (CO6)

Q.31 Differentiate between long column and short column (CO8)

Q.32 What are the assumptions made in theory of simple bending? (CO9)

Q.33 Write steps which are followed in the fabrication of steel structure? (CO10)

Q.34 What is the plate girder. Write function of various elements used in the formation of plate Girders? (CO9)

Q.35 Explain tension splices and net area in case of zig zag riveting? (CO4)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Explain different elements of steel truss. (CO6)

Q.37 Design a single angle strut for roof truss carrying a compressible Load of 180KN. the effective length of strut is 2m. (CO6)

Q.38 A double riveted cover butt joint is used for connecting plate 12mm thick the diameter of the rivet is 22 mm. Calculate necessary pitch and efficiency of the joint. Take S_{at} = 150N/mm^2 and t_{vf}= 100N/mm^2 and S_{pf}=300 N/mm^2. (CO2)

SECTION-E

Note: Long answer type questions. Attempt any two questions out of three questions. (25x2=50)

Q.39 With the help of neat sketches, explain connections between purlin and roof covering in a roof truss. (CO3)

Q.40 Draw front and side elevation of splicing arrangement of two unequal columns having different flange width with the following data:
Lower column = ISHB250 @ 536.6N/m.
Upper column=ISHB200 @392.4N/m
Distribution plate = 250mmx250mmx20mm
Packing plate thickness=25mm
Cover plate =400mmx250mmx20mm
Cleat angles=60x60x10mm
Nominal diameter of rivets=18mm

Q.41 Draw the front and side elevation of a unstiffned seated connection of beam and column for following data: (CO2)

a) Column=ISHB300@630N/m
b) Beam=ISMB250@373N/m
c) Upper cleat angle=ISA 100 x 75 x 8mm
d) Seat angle = ISA 125 x 100 x 8 mm