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6th Sem / Branch : Civil Engineering
Sub. : Steel Structure Design

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 Rolled steel beam are used to resist (CO1)
a) Bending stress
b) Compulsive stress
c) Tensile stress
d) All the above

Q.2 If the Rivert diameter is more than 26mm, then gross diameter will be (CO2)
a) 26 mm b) 27 mm
c) 28 mm d) 30 mm

Q.3 Permissible bearing stress in N/mm^2 for hand driven rivet is (CO2)
a) 300 b) 270
c) 250 d) 280

Q.4 Welding is preferred than rivetting because (CO4)
a) More economical
b) More efficiency
c) Produces less noise
d) All the above

Q.5 The member which can be used as a tie member (CO5)
a) Single angle b) Flats
c) Double angle d) All the above

Q.6 The sectional areas of a strut is given by (CO6)
a) Gross area
b) Net area
c) Effective X-sectional area
d) None of these

Q.7 In a roof trussed roof, the roofing material is supported by (CO7)
a) Purlins b) Principle rafter
c) Bottom chord d) None of these

Q.8 Splicing of a column is done to increase (CO8)
a) Cross-sectional area
b) Strength of column
c) Length of column
d) All the above

Q.9 Minimum spacing of vertical stiffeners in a plate girder is given by (CO9)
a) 0.22 d b) 0.33 d
c) 0.44 d d) 0.66 d

Q.10 A beam is defined as a structural member subjected to (CO9)
a) Axial loading
b) Transverse loading
c) Axial & Transverse loading
d) None of these

SECTION-B

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

Q.11 Steel is an alloy of _____. (CO1)

Q.12 The pitch of the rivet should not be less than____.(CO2)

Q.13 Bolts should be tightened upto required_____. (CO3)

Q.14 In welded joint, effective throat thickness =_____ x _____? (CO4)

Q.15 Net area of connected leg of single ISA is given by _____? (CO5)

Q.16 The member in a roof truss subjected to axial compression is called_____. (CO6)

Q.17 Roof trusses are economical for span more than_____. (CO7)

Q.18 _____ columns fail due to purely crushing. (CO8)

Q.19 Web crippling is also knows as _____? (CO9)

Q.20 The process of assembling the fabricated components on site is called. (CO10)

SECTION-C

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

Q.21 Enlist any five advantages of steel as a structural material. (CO1)

Q.22 Enlist five differences between lap joint and butt joint. (CO2)

Q.23 Calculate the rivet value of an 18 mm diameter power driven field rivet (PDFR) which connect two 8mm thick plates to a 10 mm thick plate, one either side of it. (CO2)

Q.24 Enlist any five merits of Bolt connection over riveted connection. (CO3)

Q.25 Explain how to calculate the strength of fillet weld is determined. (CO4)

Q.26 Explain tension splice? Why design of tension splice is required. (CO5)

Q.27 Calculate the strengthof ISA 100x65x8 mm used as a tie member with its longer leg connected at ends by 16mm diameter rivets. Provide tensile stress as 150 N/mm^2. (CO5)

Q.28 Describe the various types of sections used as tension member. (CO5)

Q.29 Define strut? Enlist any three name of common section used as a struts? (CO6)

Q.30 Describe various parts of roof truss with diagram.(CO7)

Q.31 Explain economic range of spacing of a roof truss.(CO7)

Q.32 Describe the following terms: (a) Effective length (b) slenderness ratio . (CO8)

Q.33 Enlist fie assumptions made in theory of simple bending. (CO9)

Q.34 How web crippling and web buckling. (CO9)

Q.35 Discuss important considerations followed in the fabrication of steel structures. (CO10)

SECTION-D

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

Q.36 A double riveted double cover butt joint is used for connecting plates 12 mm thick. The diameter of the rivets is 22mm, calculate necessary pitch and efficiency of the joint. Take s_{at}150 N/mm2 = 100 N/mm^2 and s_{pf}= 300 N/mm^2. (CO2)

Q.37 An ISMB 500 @852.5 N/m has been used as beam. Calculate maximum bending stress and average shear stress when it carries u.d.i. of 35 kN/m over an effective simply supported span of 8m. (CO5)

Q.38 Explain the various steps involved in the design of axially loaded compression member. (CO4)