180761/030761/0762

Sem. 6th / Civil, Brick Tech., Constr. Mgmt.
Sub : Steel Str. Deg. & Drg.

Time : 6 Hrs.   **M.M. : 150**

SECTION-A

Note: Multiple Choice Questions. All Questions are compulsory.
                                                        (10x1=10)

Q.1   The Indian standard code which deals with the steel
       structure, is   (CO-1)
       a)   IS:875   b)   IS:800
       c)   IS:456   d)   IS:13920

Q.2   the size of the rivet is expressed by the   (CO-2)
       a)   Types of head   b)   Diameter of shank
       c)   Length of shank   d)   None of these

Q.3   The strength of a riveted joint is equal to   (CO-2)
       a)   Shearing strength   b)   Bearing strength
       c)   Tearing strength   d)   Least of A, B, & C

Q.4   The minimum size of fillet weld is   (CO-4)
       a)   5mm   b)   2mm
       c)   3mm   d)   1mm

Q.5   A tie member is a   (CO-5)
       a)   Torsion member   b)   Compression member
       c)   Tension member   d)   Flexible member

Q.6   A strut is a   (CO-6)
       a)   Tension member
       b)   Compression member of a truss
       c)   Compressive member of a crane
       d)   Torsion member

Q.7   The radio of rise to full span is   (CO-7)
       a)   Slope   b)   Span
       c)   Pitch   d)   Panel

Q.8   When the value of slenderness ratio increase the value of oac.
       a)   Increase   b)   Decrease   (CO-8)
       c)   Remains same   d)   None of these

Q.9   Web crippling in a been generally occurs at the point where.
       a)   Deflection is maximum   (CO-9)
       b)   B.M. Is maximum
       c)   Concentrated load is acting
       d)   Shear force is maximum

Q.10   Maximum deflection of a simply supported beam should not
       exceed   (CO-9)
       a)   I/225   b)   I/325
       c)   I/425   d)   I/525

Section-B

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

Q.11   Steel is an alloy of _____ and _____?   (CO-1)
Q.12   Number of rivet required = _____?   (CO-2)
Q.13   Bolts should be tightened upto required ___?   (CO-3)
Q.14   thesize of butt weld is specified by the ___?   (CO-4)
Q.15   The strength of beam depends upon_____?   (CO-5)
Q.16   The member of a crane under compression is called_____.
                                                            (CO-6)
Q.17   Roof trusses are economical for span more than _____?
                                                            (CO-7)
Q.18   Strength of axially loaded columns (P)= _____?
                                                            (CO-8)
Q.19   The value of safe load carrying capacity of beam = ____
       XA.   (CO-9)
Q.20   Wrought iron is best suitable to resist _____ stresses.
                                                            (CO-10)

Section-C

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

Q.21   Explain different rolled steel sections and their used.
                                                            (CO-1)
Q.22   Describe assumptions in the analysis of riveted joints as per
       BIS 800.   (CO-2)

Q.23 How the efficiency of a riveted joint is calculated. (CO-2)
Q.24 Enlist any five advantage of bolt connection over riveted connection. (CO-3)
Q.25 Calculate the strength of a fully penetrated butt weld if the thickness of section 12 mm and permissible shear stress 108 N/mm^2 (CO-3)
Q.26 Explain how to calculate the strength of a fillet welf & butt weld joint. (CO-4)
Q27 Calculate the strength of ISA 100x75x8 mm used as a tie member with its longer leg connected at ends by 16 mm diameter rivets. Provide tensile stress as 150 N/mm^2. (CO-5)
Q.28 Write a short note on taking rivet? (CO-5)
Q.29 Enlist the various steps involved in the design of laterally restrained beam. (CO-6)
Q.30 Explain the following terms (i) Radius of gyration (ii) slenderness ratio. (CO-6)
Q.31 Define roof truss? Enlist different part of a roof truss with diagram. (CO-7)
Q.32 Enlist factors which affect the selection of type of roof truss. (CO-7)
Q.33 Define column base? Explain different types of column base. (CO-8)
Q34 Explain the various elements used in the formation of plate girder with their uses. (CO-9)
Q.35 Enlist the various steps which are followed in the fabrication of steel structures. (CO-10)

Section-D

Note: Long answer questions. Attempt any two question out of three Questions. (2x10=20)
Q.36 Find the suitable pitch for a single rverted lap joint of plates 12mm thick. Take values of o_{at} = 150 N/mm^2 t_{vt} = 100 N/mm^2 and 0_{pf} = 300 N/mm^2. Also calculate the efficiency of the joint corresponding to the selected pitch. (CO-2)
Q.37 Calculate the tensile strength of a tension member ISA 100x65x8 mm, when it is connected by its (a) longer leg (b) Shorter leg to a gusset plate using 20 mm diameter rivet. Permissible tensile stress in 150 N/mm^2. (CO-5)
Q.38 Explain the various steps involved in the design of axially loaded compression member. (CO-6)

Section-E (Steel structure Drawing)

Note: Attempt any two questions out of three questions. (25x2=50)
Q.39 Draw the plan, front and side elevation of Column base from the following date: (CO-2)
Column - ISHB 350@ 661.2 N/m
Base plate = 700mm x 600 mm x 20 mm
Cover Plate = 2 No's 250 mm wide and 10 mm thick
Flange cleat angle = ISA 100x100x10 mm
Web Cleat angle = ISA 100x10010mm
Holding down bolts=10mm 200 mm log-4 No's Rag bolts
Nominal diameter of rivets = 16 mm
Reinforced Cement Concrete slab base=1000 mm x 900 mm x 500 mm
Reinforcement in slab base = 12mm @ 150 mm c/c both way.
Q.40 Draw the front and side elevation of two unequal column splicing arrangement with the following data: (CO-3)
Lower column = ISHB 300@618.1 N/m(CO-2)
Upper colomn = ISHB 250@500.3 N/m
Cover plates = 400mmx250mmx20mm
Distribution plate = 300mmx250mmx20mm
Thickness of packing plate = 25mm
Cleat angle = ISA 75x75x8m
Nominal diameter of rivets = 20 mm
Use Steel Table for other details.
Q.41 Draw front elevation, sectional plan of a plate Girder from the following design data. (CO-4)
Clear span of plate girder = 8 mm
Web plate = 1000 mmx80mm
Flange angled = 2 ISA-150x115x8 mm
Bearing plate = 300x400x12mm
Thickness of filler plate = 8 mm
End bearing stiffeners = ISA 150 x 115 x 8 mm
Intermediate stiffeners = ISA 100x75x8mm @ 1000 mm c/c
Flange plate = 400x10mm one at top one at bottom
Size of concrete block = 300x400x200 mm