5ᵗʰ Sem - Civil Engg. /Constr. Mgmt. (Spl.HighwayEngg.)
Subject:- Steel Structure Design

Time : 3Hrs.   M.M. : 100

SECTION-A

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

Q.1 With a percentage increase of carbon in steel, decreases   (CO1)
   a) Hardness   b) Brittleness
   c) Ductility   d) Strenght

Q.2 The most economical section for a column is (CO7)
   a) Angle section   b) Tubular section
   c) I-section   d) Solid round section

Q.3 A tie is a ....   (CO4)
   a) Compression member
   b) Tension member
   c) Flexible member
   d) Torsion member

Q.4 The permissible longitudinal pitch in a riveted joint in tension is   (CO4)
   a) 12t or 200mm whichever is less
   b) 16t or 200mm whichever is less
   c) 2.5D
   d) 4t + 100mm

Q.5 Column is a member in tension   (CO7)
   a) True   b) False

Q.6 The maximum shear stress of steel beam not exceed   (CO8)
   a) $0.40f_y$ b) $0.45f_y$
   c) $0.50f_y$ d) $0.55f_y$

Q.7 The Indian standard code which deals with steel structures, is   (CO9)
   a) IS :456   b) IS :875
   c) IS :800   d) IS :1893

Q.8 The minimum spacing of vertical stiffeners in plate girder is given by   (CO9)
   a) d   b) 0.7 d
   c) 0.5 d   d) 0.33d

Q.9 Depth of foundation depends on   CO10)
   a) Type of sub soil
   b) Safe bearing capacity of soil
   c) Angle of repose of soil
   d) All of these

Q.10 Depth of foundation for brick pillar and load carrying walls should not be less than ....
.......(COD10)
   a) 300mm   b) 500mm
   c) 600mm   d) 1000mm

SECTION-B

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

Q.11 The manufactured steel rolled to sections and weight as specified by Bureau of Indian Standards is called   (CO1)

Q.12 Expand the term ISJB   (CO1)

Q.13 Number of rivets required = ... / Rivet value   (CO4)

Q.14 Tacking rivets are provided at a pitch of not more than ....   (CO4)

Q.15 A column splice is used to increase ....   (CO7)

Q.16 When one end of column is fixed and other end free, then effective length =..................................   (CO7)

Q.17 The principal rafter is a .... member   (CO9)

Q.18 Rise given with central panel at bottom is called
.... (CO9)

Q.19 Foundations are provided to load the sub stratum evenly and to prevent unequal settlement (True/False) (CO10)

Q.20 The width of last course of pillar or wall should be equal to .... the width of wall or pillar in superstructure. (CO10)

SECTION-C

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

Q.21 Write the names of the various types of rivets along with their sketches. (CO2)

Q.22 Write a short note on zig-zag riveted joint. (CO2)

Q.23 Find the efficiency of a single riveted lap joint with the given data : Diameter of rivet = 22 mm, pitch of rivets = 70 mm, Thickness of plates= 12mm,s_{at} =150N/mm^2,i_{vf}= 90N/mm^2 and s_{pf}= 270N/mm^2 (CO2)

Q.24 Write any five disadvantages of welded joints.(CO3)

Q.25 Write the names of various types of fillet weld along with their sketches (CO3)

Q.26 Calculate the strength of single angle ISA 100mm x 75 mm x 8 mm used as a tie member with longer leg connected at ends by 14 mm dia. rivets on the gusset plate. Take f_{st} = 150 N/mm^2 (CO4)

Q.27 Write the importance of net effective area in a tie member (CO4)

Q.28 Calculate the safe load for a 8 mm fillet welded joint with effective length of 150 mm. The permissible shear stress in the weld is 108N /mm^2 (CO3)

Q.29 Write a short note on classification of columns (CO5)

Q.30 What is buckling of colums ? (CO5)

Q.31 Draw and name the main parts of a roof truss. (CO6)

Q.32 How will you find out the economic spacing of roof trusses? (CO6)

Q.33 Calculate the load carrying capacity of ISMB 350 @ 514 N/m to be used as a column the effective of the column is 3.5 m (CO7)

Q.34 Write a short note on buckling of columns. (CO7)

Q.35 Write the assumptions made in the theory of simple bending (CO8)

SECTION-D

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

Q.36 Calculate the safe axial load carried by a bulit-up column of ISHB 400 @ 759.3 N/m with a plate 400 x 16mm is welded to each flange. The column is 4.0m long and is effectively held in position at both ends but not restrained against rotation. Take f_y= 250 N/mm^2 (CO5)

Q.37 Write the steps for design of axially loaded tension member. (CO4)

Q.38 A simply supported steel beam carries a superimposed load of 38.5kN/m over an effecctive span of 7.8 m. Design the beam and check for shear and deflection. Take premissible bending stress 165 N/mm^2,shear   stress 100 N/mm^{2}and E= 2.1 x 10^5 N/mm^2 (CO8)