

12. Cement concrete block $\left(1:1\frac{1}{2}:3\right) = 300 \text{ mm} \times 300 \text{ mm} \times 200 \text{ mm}$
13. Thickness of wall = 450 mm
14. Gusset plate = 10 mm thick
15. Roof cover material = Corrugated A.C. sheets.

Any another data required may be assumed suitably.

Q.27 Draw the front and side elevation of two unequal column splicing with the following data:

Lower column = ISHB 300 @618.1N/m

Upper column = ISHB 250 @500.3N/m

Cover plates = 400 mm x 250 mm x 20 mm

Distribution plate = 300 mm x 250 mm x 20mm

Thickness of packing plates = 25 mm

Cleat angles = ISA 75 x75 x8 mm

Nominal diameter of rivets = 20 mm

Q.28 Draw the suitable scale front elevation and side elevation of framed beam to beam connection with the use of the following data

Main beam = ISWB 450@778.9 N/M

Secondary beam = ISLB 250@273.7 N/M

Web cleat angle= 2-ISA 80 x80 x8mm

Nominal diameter of the rivet = 20 mm

Q.29 Draw to a suitable scale the sectional plan, front elevation and cross section of the plate girder from the following data:

Clear span = 12.0 m

Web plate = 1000 mm x 12 mm thick

Top and bottom flange cover plates = 300 mm x 12 mm thick

Flange angles = 4 - ISA 90 mm x 90 mm x 10 mm

Bearing plate = 200 mm x 300 mm x 20 mm

concrete block = 300 mm x 300 mm x 200 mm

Diameter of rivets = 20 mm

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Roll No.

6th Sem / Civil

Subject : Steel Structural Design and Drawing

Time : 6 Hrs.

M.M. : 120

SECTION-A

Note: Multiple choice questions. All questions are compulsory
(6x1=6)

- Q.1 Diameter (\varnothing) of the rivet in mm (CO2)
- a) $\varnothing = 6\sqrt{t}$
 - b) $\varnothing = t\sqrt{6}$
 - c) $\varnothing = 6\sqrt{d}$
 - d) $\varnothing = d\sqrt{6}$
- Q.2 The ability of a material to regain its original shape after removal the load without breaking is called (CO1)
- a) Elasticity
 - b) Plasticity
 - c) Creep
 - d) None of these
- Q.3 In fillet weld, the weakest section is along the:-
- a) Throat
 - b) Leg
 - c) Face
 - d) Root
- Q.4 Load carrying capacity is more in : (CO4)
- a) Long column
 - b) short column
 - c) Medium column
 - d) all of these
- Q.5 Unit of the radius of gyration is
- a) mm
 - b) mm^4
 - c) mm^3
 - d) mm^2
- Q.6 In a truss a tie member is mainly subjected to:-
- a) compression member
 - b) tension member
 - c) Both compression
 - d) Bending

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SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

- Q.7 ISMB Stand for _____ (CO1)
Q.8 Write the pure Bending Equation? (CO5)
Q.9 Minimum Pitch of Rivets is taken as _____? (CO2)
Q.10 Define gusset plate. (CO5)
Q.11 Slenderness ratio is the ratio of _____ (CO6)
Q.12 Write two type of the welded joint? (CO6)

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

- Q.13 Write the advantages and disadvantages of steel as a structural material? (CO2)
Q.14 Describe various rolled steel section and uses in steel structure. (CO1)
Q.15 How strength and efficiency of Riveted Joint are calculated.
Q.16 What is the welding and explain types of welds? (CO4)
Q.17 Write the assumptions made in the theory of simple bending. (CO5)
Q.18 Define the following terms: effective length & slenderness ratio
Q.19 Explain the following term; (CO2)
a) Pitch b) End Distance
Q.20 Calculate the strength of the one 20 mm (nominal) diameter rivet in single share and double share when the permissible shear stress in rivet is 120N/mm^2 . (CO5)
Q.21 Calculate the safe load for an 8mm fillet welded joint having effective length of 80 mm. The permissible stress = 100 MPa. (CO3)

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- Q.22 Calculate the strength of the single angle $125 \times 75 \times 8\text{mm}$ used as a tie member with longer leg connected by 16 mm rivet on the gusset plate. Take $f_{st} = 150\text{N/mm}^2$. (CO3)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

- Q.23 How you will calculate strength and efficiency of a bolt joint. Also write four Assumption in the theory of bolt joint.
Q.24 Write a short note on spacing of trusses and spacing of purlins.
Q.25 Explain the various mechanical properties of the steel? (Co1)

Steel Structure Drawing (Part-B)

Attempt any two questions out of four questions. (20x3=60)

- Q.26 Draw the front elevation and detail of the join in a simple fink roof truss in which the following detail of various element are as follow:
1. Clear span = 8.0 mt
 2. Pitch of truss = 35°
 3. Principal rafter (top chord member)= ISA 75x75x 8mm.
 4. Main tie (bottom chord member)= Double ISA 65 x65x8 mm
 5. Upper tie member = Single 65 x65x 6 mm
 6. Struts (central chord members) single ISA 65x65x 6mm
 7. Cleat and purlin angles = Single ISA65x65x10mm
 8. Shoe angle = Double ISA 75 x75x6mm
 9. Bearing plate = 350mm x 350mm x 20 mm
 10. Rag bolts = 16 mm \varnothing 180 mm long
 11. Rivets = 22 mm \varnothing

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