

Question Bank (I scheme)

Name of Course: Design of Steel and RCC Structures

Subject code: 22502

Semester: Fifth

Programme: CIVIL

Unit test I

Unit 1- Fundamental of steel structures (6marks)

2 marks question

1. State advantages and disadvantages of steel as a construction material.
2. Enlist the components and its functions in steel water tanks.
3. Write the functions of steel bridges.
4. Draw any four types of structural steel sections.
5. State types of loads to be considered while designing and steel structure. Also state respective IS-codes.

4marks question

6. Explain typical Stress-strain graph for Mild steel?
7. What are the methods of Design and differentiate them?
8. Explain the Terms:
 - i. Limit state of Strength.
 - ii. Partial safety factors for Loads.
 - iii. Limit state of serviceability
 - iv. Partial safety factors for material strength.
9. State any four rolled steel sections used and draw the sketch of any one.

Unit 2- Design of steel connections (14 marks)

2marks question

10. Write any four disadvantages of Bolted connections. Differentiate natural and forced convection.
11. Explain any two types of failure of bolted joint along with drawing of respective sketches.
12. State the advantages and disadvantages of welded connections over bolted connections. Write any four points of differences.
13. Define Bolt value, pitch, gauge and edge distance in bolted joint.
14. Define effective length of weld. State how to calculate length of weld required.

4marks question

15. Determine the bolt value of 20mm diameter bolt connecting 10mm plate in (i) single shear, (ii) double shear. Bolts used are 4.6 grade, plate of 410 grade. Take area of bolt = 245 mm^2 .
16. Design the lap joint between the plates of sizes 100 X 16 mm thick and 100 X 10 mm thick so as to transmit a factored load of 110 kN using single row of 16mm bolts of grade 4.6 and grade 410 plate.
17. A single jointed lap joint is used to connect two plates 10mm thick. If bolts of 20mm are provided at 50 mm pitch, calculate the efficiency of the joint. Use Fe 410 plate and 4.6 grade bolt.
18. A 80mm X 8mm plate is to be connected to a 120 X 8mm plate in a lap joint to transmit a factored pull of 125 kN. Using 6 mm fillet welds, design the connections.
19. Find safe load transmitted by a fillet welded joint between a flat 60mm wide overlapping 100mm over a gusset plate. Thickness of both plates is 10 mm. Weld is on all sides of overlap. Size of weld is 6mm, which is provided at shop.
20. A plate 150mm X 10mm is connected by 8mm fillet weld. Find lap required to provide only longitudinal weld. Draw neat sketch and use I.S. specifications.

Unit 3- Analysis and Design of singly reinforced sections (14 marks)

2marks question

21. Draw Stress-strain Curve for concrete. Also indicate design values with regard to LSM.
22. State the four assumptions made in Limit State of Collapse for flexure.
23. Define characteristic Strength and Characteristic loads.
24. State maximum and minimum reinforcement for beam, slab, shear and column.

4marks question

25. What is reinforced concrete? Draw equivalent stress distribution diagram for singly reinforced section in LSM?
26. A beam having dimension 230 X 450mm effective is reinforced with 4 bars of 16 mm diameter on tension side. Calculate the ultimate moment of resistance of the beam if M20 grade concrete and Fe 415 steel is used.
27. Find the moment of resistance if steel provided is 6 bars of 12 mm diameter in a beam 300mm X 500mm effective. Concrete M20 and steel Fe500 are used.
28. Find limiting moment of resistance and steel required for a beam 300 X 600mm (effective), if concrete M25 and Fe 415 steel are used.