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Civil engineering

Probable questions of SD-2 (CEP-502)

Chapter 1: introduction

2 mark questions

1. Define structural steel
2. Define rolled steel sections
3. Define limit state

5 mark questions

1. Explain briefly about rolled steel sections
2. Write the physical and mechanical properties of structural steel
3. Differentiate working stress and limit state method

10 mark questions

1. Describe the advantages and disadvantages of steel structures

Chapter 2: structural steel fasteners and connections

2 mark questions

1. Define pitch
2. Define gauge distance
3. Define edge and end distance
4. Define efficiency of a bolted connection

5 mark questions

1. Explain briefly about classification of different types of bolts
2. Differentiate bolted and welded connections
3. Explain briefly about different types of welds
4. Find the efficiency of a double bolted cover butt joint. Consider main plate thickness as 16mm each and cover plates as 8mm each. Plates are of Fe 410 grade and 4 bolts of grade 4.6 have been provided on each side (chain bolting).
5. Calculate the efficiency of a lap joint used for joining two 12mm plates of grade Fe 410 and 6 bolts of grade 4.8 in chain bolting.
6. A 18mm thick plate is joined to a 16mm plate by 200mm long butt weld. Determine the strength of joint if

All the best

a. Double v-butt joint is used
b. Single v-butt joint is used

Assume Fe 410grade plates and shop welding

10 mark questions

1. Design a lap joint connecting two plates of 16mm thick to transfer a total working load of 120 Kn. Assume any other suitable data.
2. Design a suitable longitudinal fillet weld to connect two plates each of 14mm thick in a lap joint to transfer a total factored load of 220kn. Assume any other suitable data.
3. Design a welded connection to connect two plates of width 200mm and thickness 10mm for 100% efficiency.

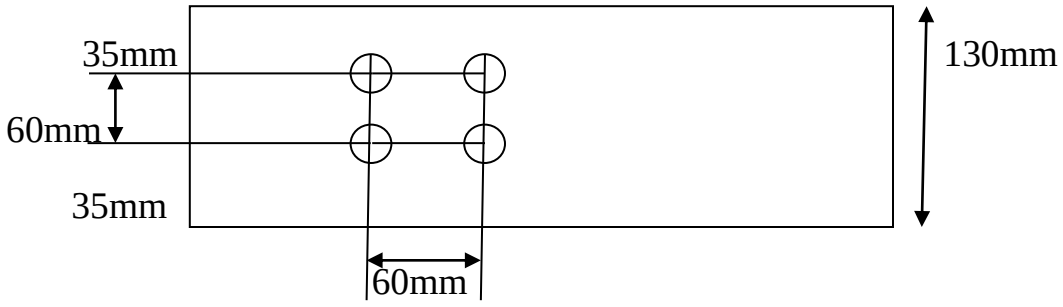
Chapter 3: design of steel tension members

2 mark questions

1. Define net effective area
2. Define block shear

5 mark questions

1. Determine the design tensile strength of the plate 130mmx12mm with the holes for M16 bolts as shown in fig. steel plate used is of Fe410 grade



2. Determine the tensile strength of a single unequal angle section ISA90x60x10 connected to a gusset plate of 10mm thickness with 5 no of bolts in a line.

All the best

a. If the gusset connected to 90mm leg
b. If the gusset connected to 60mm leg

10 mark questions

1. Design a suitable unequal angle section to transfer a factored load of 500kn. Assume any other suitable data.
    a. bolted connection
    b. Welded connection
2. Describe the steps of designing a steel tension members

Chapter 4: design of steel tension members

2 mark questions

1. Define strut
2. Define a stanchion
3. Define radius of gyration
4. Define effective length of a column

5 mark questions

1. Determine the design compressive strength of a column ISHB 300@577N/m. if the actual length of column is 3m and both ends are pinned.
2. Explain the steps of designing a compression member

10 mark questions

1. A column 4m long has to support a factored load of 6000kn. The column s effectively held at both ends and restrained in direction at one of the ends. Design the column. Assume any other suitable data.
2. Design a single angle strut connected to a gusset plate to carry a factored load of 180kn. Actual length of column between the supports is 3m.

Chapter 5: steel column bases and foundations

2 mark questions

1. Define slab base
2. Define gusseted base

3. Define bearing strength of concrete

5 mark questions

1. Differentiate slab base and gusseted base
2. Draw a neat diagram of slab base and show the elements
3. Explain the steops of designing a slab base.

10 mark questions

1. Design a slab base for a column ISHB 300@577n/m carrying an axial factored load of 1000kn. M20 grade concrete is used. Provide welded connection to connect column with the base plate. Design the connection as well.
2. Design a slab base fie a column ISHB 400@34604n/m carrying an axial working load of 350kn.use M25 grade concrete for foundation.

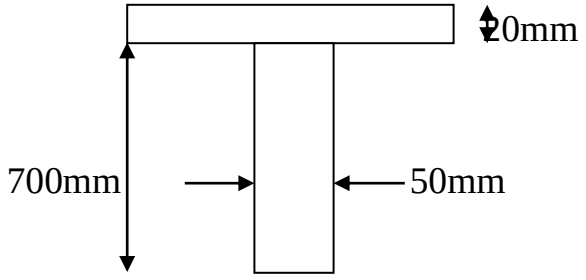
Chapter 6: design of steel beams

2 mark questions

1. Define beam
2. Define plastic modulus
3. Define plastic section
4. Define a plastic hinge
5. Define laterally supported beam

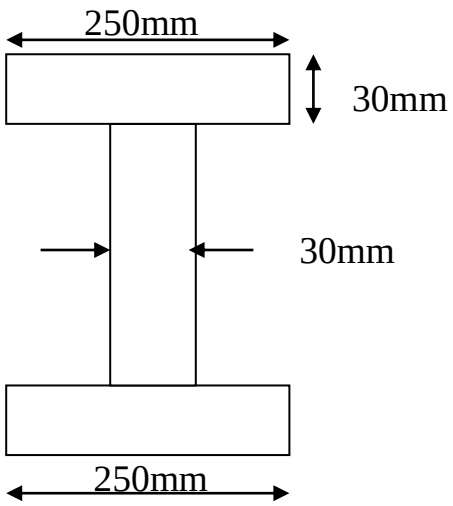
5 mark questions

1. Explain web buckling
2. Explain web crippling
3. Explain the steps of finding the design bending strength of a laterally supported beam
4. Explain the steps of finding the design shear resistance of a laterally supported beam
5. Determine the plastic moment carrying capacity of the following T beam



All the best

6. Calculate the elastic and plastic modulus of the following beam cross-section.



7. Explain the classification of beam cross-sections in brief.
8. Calculate the design bending strength of a beam ISMB 350@5204kg/m

10 mark questions

1. Design a simply supported steel beam of effective span 1.5m carrying a factored concentrated load of
    a. 200kn at mid span
    b. 500kn at mid span
    c. 400kn at mid span

Chapter 8 : design of timber structures

2 mark questions

1. Define slenderness ration of columns
2. Define short column and long column
3. Define effective span of a timber beam
4. Define select grade timber

5 mark questions

1. Differentiate steel structures and timber structures
2. Explain various defects in timber
3. Explain various grades of timber
4. Explain permissible stresses in timber

All the best

5. Determine the safe axial load of a Sal wood(MP) column of 150mmx200mm, if unsupported length of column is
    a. 1.5m
    b. 2.8m
    c. 4m

    Assume inside location and standard grade

6. Explain the steps of designing a solid circular timber column.

10 mark questions

1. Explain the steps of designing a timber beam and also mention the necessary checks to be done
2. Design a solid circular deodar wood column for following data.
    a. Axial load on the column is 650kn
    b. Effective length of column is 4m
    c. Assume inside location
3. A Sal wood beam of standard grade carrying an total load of 20kn/m supported on masonry walls at both ends. Design the beam for flexure, shear and bearing. Given clear span of beam is 3m and inside location.

All the best