Structural Design & Drawing - II
(1060)

P. Pages : 2

Time : Four Hours

Max. Marks : 100

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Solve **any one** question from each unit.
5. Use of non programmable calculator is allowed.
6. Ref IS 800, IS 875, Steel table is permitted.
7. Assume data wherever necessary
8. FY = 250 MPa

UNIT - I

1. a) Differentiate between riveted and welded joints. 8

    b) Explain types of weld, how to find strength of each weld. 7

    c) Design a suitable fillet welded it between two plates of size 180 mm x 8 mm and 200 mm x 8 mm to develop the full strength of the smaller plate in tension σ at$_{perm}$ = 150 MPa. 10

2. Determine the tensile strength of a roof truss diagonal $\angle$ 100 x 75 x 10 mm (ISA) connected to gusset plate by 20 mm PDSR and 5 mm fillet weld. 25

UNIT - II

3. Design a column to carry an axial load of 1400 kN. Effective length in both planes is 6.5 m use two channels back to back. Also design the lacing system to connect the two channels. 25

4. Design a roof truss for the following data :
    Span of the truss = 15 m
    Spacing of trusses = 4 m
    GI sheets are available for roof covering design top chord & bottom chord members only. 25

UNIT - III

5.   a)   What is the difference between laterally supported and unsupported beam.   **5**

      b)   Design the beam of 5 m effective span carrying a load of 20 kN/m if the compression flange is laterally unsupported.   **20**

6.   Design a welded plate girder for a simply supported span of 18 m and superimposed load of 100 kN/m over the entire span.   **25**

UNIT - IV

7.   Design a foot over bridge for
N - type turns girder
span of girder = 18 m c/c, Height of girder = 1.8 m
spacing of cross girder = 2.25 m c/c
live load = 4 kN/m^2
clear width or pathway = 3.00 m
design planks, cross girder, top & bottom chord.   **25**

8.   Design a suitable slab base for column carrying an axial load of 1000 kN.
The section of column is built up of ISHB 350 @ 0.661 kN/m and two
cover plates 300 mm x 12 mm one on each flange of the section
SBC = 250 kN/m^2. Permissible compressive stren in concrete is 2500 kN/m^2.   **25**

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