

B.E. Eighth Semester (Civil Engineering) (CGS)
10232 : Professional Elective-II : Advanced Design of Steel Structures
8 CE 04

P. Pages : 2

Time : Four Hours



AU - 2970

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Answer **Two** question from Section A and **Two** question from Section B.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. I.S.I. Hand book for structural Steel section, I.S. Code 800/1962 or 1964, I.S. 456 (Revised) I.S. 875 may be consulted.
 6. I.S. 6533-1971 and I.S. 804-1958 may consulted.
 7. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. Design a foot bridge using N-type truss, for following data. 20
- Span of Girder = 16m
Spacing of cross Girder = 2m c/c
Clear walking width between main girders = 2.5m
Live load = 4000 N/m²
Flooring :- Timber planks on cross girders
Design following members and joints.
- a) 4th bottom chord member from left.
 - b) 4th top chord member from left.
 - c) 1st diagonal member from left.
 - d) 1st vertical member from left.
 - e) Design one joint and rakers.

OR

2. Explain analysis and design procedure of transmission tower. 20
3. Design a self supporting chimney to the following particular. 20
- a) Height of chimney = 60m
 - b) Diameter of chimney = 3m
 - c) Thickness of lining = 0.10m
 - d) Wind pressure = 1.5 kN/m²
- Draw elevation of chimney assume suitable safe stresses.

OR

4. Design a through type highway bridge of span 30m. The clear width of roadway is 7.5m. Bridge is to be designed for IRC class A loading and check IRC class AA. Design top chord member, bottom chord member and vertical member. Draw the sketches giving structural details. 20

SECTION – B

5. Design a gantry girder for an industrial building for following data :- 20
- 1) Crane capacity = $W_k = 100 \text{ kN}$
 - 2) Crane girder weight = $W_c = 50 \text{ kN}$
 - 3) Wheel spacing = $a = 3.5 \text{ m}$
 - 4) Weight of crab car = $W_r = 20 \text{ kN}$
 - 5) Column spacing i.e. equal to gantic span $L = 9 \text{ m}$
 - 6) Bay width = $B = 12 \text{ m}$
 - 7) Minimum edge distance of crane $g = 1000 \text{ mm}$
- Check for critical stresses and draw the structural details.

OR

6. A span of knee braced roof trusses over an industrial building 30m long is 10m. The spacing of roof is 3m. The pitch of roof is 1 in 4. The asbestos cement corrugated sheets are used for roof covering. The basic wind pressure is 1.5 kN/m^2 and there is no snow fall. The height of eaves above ground level 7.5m. Propose a suitable type of roof truss. Determine the load at various pond points due to dead load, live load and wind load. Determine the reaction also. 20
7. A 30 x 150m area is to be covered by using north light trusses and lattice girder. Give detailed layout of structure with appropriate dimension. Calculate panel point load due to wind load, live load and dead load as per I.S. 875 specification for lattice girder. 20

OR

8. Design an elevated rectangular pressed steel tank for a capacity of 1,20,000 liters. The height of staging up to up to the top of the column is 12m. Design the tank with stays and supporting beams. 20

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