

[illegible]

Total No. of Questions : 10

STRUCTURE DESIGN – IV

Subject Code : BACH-508

M.Code : 71752

Max. Marks : 60

1. Attempt FIVE questions taking any ONE question from EACH UNIT.
2. All questions carry EQUAL marks.
3. Assume any missing data.
4. Use of Steel tables and IS 800 is allowed.

1. a) Explain the term Radius of Gyration and effective length of columns. 5
b) Design a single angle connected to a gusset plate (with two bolts) to carry 180 kN factored load. The length of the strut is 3 meters c/c. Assume $f_{cd} = 90$ MPa. 7
2. Determine the design axial load carrying capacity of the column of ISHB 300 @ 577 N/m if the column is 3.0 m long with both ends pinned. Take $f_y = 250$ MPa. 12

3. a) Discuss classification of cross-sections on the basis of IS 800:2007. 5
b) Discuss bending and shear strength of a laterally supported beams. 7
4. An RCC slab is supported on steel beams of effective span 8.3 m which are spaced at 3.0 m c/c, Allow a live load of 3.0 kN/m². Take dead load as 12.8 kN/m². Design an I-section (beam) and check it for deflection also. 12

5. Design a tie member of truss for pulling force of 250 kN check it for reversal of stresses under wind loads, compressive force to be included in the member is 60 kN and node to node distance is 2.0 m. 12
6. Design a strut for a compressive force of 50 kN and tensile force of 70 kN (under reversal of stresses). The length of the strut is 2.235 m. 12

UNIT-IV

7. Design suitable beam sections for upper tier of a two-tier grillage foundation for a column to support an axial load of 2000 kN. The size of the base plate is 800×800 mm. The safe bearing capacity of soil is 200 kN/m^2 . 12
8. Draw a neat sketch of two-tier grillage footing along with its bending moment diagram. Mark the point of maximum bending moment and shear force. Also explain under what circumstances the grillage footing is provided. 12

UNIT-V

9. a) Explain various types of failures of riveted joints with the help of diagrams. 7
- b) Differentiate between Pitch and Gauge. Also, explain efficiency of joint in brief. 5
10. a) Explain various advantages and disadvantages of welded connections over riveted connections. 7
- b) Write short notes on : 5
- i) Throat thickness and Size of weld.
- ii) Plug and slot weld

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.