

Code: R7420101

B.Tech IV Year II Semester (R07) Supplementary Examinations January 2014

ADVANCED STRUCTURAL DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 Design a T-shaped cantilever retaining wall for the following data:
Height of wall above ground = 4.5 m
Depth of foundation = 1.5 m
Unit weight of earth fill = 17 kN/m^3
Angle of internal friction = 20°
Coefficient of friction between soil and concrete = 0.45.
S.B.C of soil = 130 kN/m^2 . Use M15_{mix}.
- 2 An open rectangular tank 4 m × 6 m × 3 m deep rests on firm ground. Design the tank. Use M20_{mix}.
- 3 Explain the procedure adopted in the design of chimneys and draw typical cross section showing details of reinforcement.
- 4 Design an elevated circular steel tank to hold 20,000 liters of water. The staging and the circular supporting beam need not to be designed.
- 5 Design a deck slab bridge for the following data:
Clear distance between abutments = 7.5 m
Road – N.H (two lane) wearing coat = 80 mm (avg)
Footpath: 1 m on either side loading 1 RC class AA (tracked) use M30 & Fe 415 steel.
- 6 Design a plate girder bridge with the following data:
Span = 16 m
Top level of railway embankment = 100 m
Bed level of stream = 90 m
Ground level for foundation = 95 m
Stream bund top level : 101.0 m.
- 7 What is significance of ductility in multistory building system? Explain in detail about the variables affecting the ductility.
- 8 A through type highway steel bridge 48 m span, is supported on two N-girders each consisting of 10 bays of 4.8 m each, the height of the N – girders being 4.8 m. The dead load of bridge including self weight of two N girders is 90 kN/m and the rolling load on the bridge, to be carried by the two girders is equivalent to 100 kN/m. Design top and bottom chords at the fifth panel of bridge.
