

B.E. Civil Engineering ,4 th Year 2 nd Semester Examination, 2022

Subject – Design of Structures –IV (Hons.)

Full Marks- 70

Time: Four hours

Answer any two questions

(IS 456,875,1893,800,801,804,3370,3935 and SP 6(1) are allowed in the hall )

1. A square pressed steel tank 6.25m X 6.25 m X 2.5 m (depth) is to be supported at 10 m height above ground in Kolkata. Suggest a suitable staging system and calculate the seismic force and moment acting at the foundation level (2 m below ground level). Assume practical value of any other data that you may need. 35
2. Design and detail the girders including shear connectors of a concrete deck-steel girder composite foot bridge of span 10 m and overall width including kerbs as 4.5 m suggesting the general arrangement .Take live load = 4 kN/sq.m . Assume M25 concrete . Assume un-propped construction. 35
3. A semi-underground concrete water tank of inner dimensions 8 m x 6 m X 3m (depth) has 200 mm above GL.The soil has a unit weight of 18 kN / cu.m. and an angle of internal friction of  $30^{\circ}$ .Design the long wall only and check for an allowable crack width of 0.2 mm. 35
4. Define structural repair , retrofit and rehabilitation. Explain the principle and purposes of any two non-destructive tests mentioning the limitations. Explain the utility and limitations of 'core cutting' test. 35