Code: CE7T4

IV B.Tech - I Semester – Regular Examinations – November 2015

ADVANCED STRUCTURAL ENGINEERING
(CIVIL ENGINEERING)

Duration: 3 hours   Max. Marks: 70

Use of relevant I.S. codes and IRC standards is permitted.
Data not given and found necessary may be assumed suitably

Answer any FIVE questions.   All questions carry equal marks

1. A prestressed concrete beam of span 6m and size 300 mm x 600 mm is subjected to a live load of 20 kN/m. Calculate the prestressing force required at an eccentricity of 200 mm to nullify the stress at bottom fiber at transfer. For that prestressing force calculate the stress at top fiber at working and transfer.   14 M

2. Compute the design live load moments for the reinforced concrete slab specified data given below, using IRC class AA loading, and also using IRC class A loading.

Carriage way - two lanes (7.5 m)   Wearing coat - 80 mm
Foot paths - 1 m on either side   Width of bearing-0.4 m
Clear span - 6m

Materials - M 25 grade concrete and Fe - 415 grade steel

14 M

3. Design a solid slab bridge for IRC class A loading for the following data
    a. Clear span = 6.5 m
    b. Clear width of roadway = 7.5 m
    c. Average thickness of wearing coat = 80 mm
    d. Grade of concrete: M25 Grade of steel reinforcement: Fe 415

14 M

4. Design the cantilever slab of a tee beam and slab bridge deck using following data.

Width of road way=7.5m	Spacing of longitudinal girders= 2.5m
Width of kerb = 600 mm	Thickness of wearing coat = 80 mm
Depth of kerb=300 mm	Type of loading is IRC class A wheeled
Number of longitudinal girders = 3	M 20 concrete and Fe 415 steel are used
Width of girder = 300 mm	

Also sketch the details of reinforcements.   14 M

5. Design an Intze tank to hold 10,00,000 litres of water. The base of the tank is 20 meters above the ground level. Use M 20 grade concrete and Fe 415 grade steel to design Top dome, Top ring beam and Cylindrical wall.   14 M

6. Explain the procedure for design of a Tower.   14 M

7. a) Distinguish between strong form and weak form of Finite Element method. 7 M

   b) Explain the concept if Isoperimetric element with respect to 1D FEM. 7 M

8. Explain with the help of an example, the calculation of base shear in single bay two story frame as per IS 1893: 2003. 14 M