

Code: CE7T4

**IV B.Tech - I Semester – Regular / Supplementary Examinations  
November 2016**

**ADVANCED STRUCTURAL ENGINEERING  
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. What is the basic concept of pre-stressed concrete with examples? Also explain the various types of pre-stressing.  
14 M
2. Explain in detail – Importance of site investigation in bridge design.  
14 M
3. A road bridge deck consists of a reinforced concrete slab continuous over Tee beams spaced 2 m apart and cross girders spaced at 5 m centers. Thickness of wearing coat = 100 mm. Type of loading is IRC Class AA tracked vehicle. Using M-25 grade concrete and Fe-415 HYSD bars design the R.C slab and draw the cross section and longitudinal section of the slab.  
14 M
4. Design a R.C.C Tee beam girder for a national highway bridge to suit the following data:  
Effective span of girders= 16 m

Foot path – 1 m on either side

Live load = I.R.C. Class – AA tracked vehicle

Thickness of wearing coat = 80 mm, number of main girders = 4

Concrete = M–20 grade

Steel = Fe–415 grade of steel

Spacing of cross girders = 4 m, spacing of main girders = 2.5 m

14 M

5. Plan and design an overhead water tank of capacity 1,20,000 liters. Circular and having a Domed top and a flat bottom if the elevation of the tank is 16 m above ground level. Assume suitable stresses and other data.

14 M

6. Briefly explain the different types of bracing system used in Transmission Line tower members.

14 M

7. Derive the element stiffness matrix for a two dimensional beam element using displacement based FEM procedure.

14 M

8. Describe the provisions adopted for ductility of columns subjected to bending and axial load as per IS: 13920:1993.

14 M