BICEE-011

B.Tech. IN CIVIL ENGINEERING (BTCLEVI)
Term-End Examination
December, 2014

00175

BICEE-011 : EARTHQUAKE RESISTANT DESIGN OF STRUCTURE

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any **five** questions. Assume any missing data. Use ISI 893-2002 and ISI 3920-1993. Use of scientific calculator is allowed.*

1. Write short notes on the following : $4 \times 3\frac{1}{2} = 14$

    (i)   Primary waves and Secondary waves

    (ii) Magnitude of earthquakes and intensity of earthquakes

    (iii) Design spectrums

    (iv) Raleigh wave and Love waves

2. Discuss the general design principles of earthquake resistance of tall buildings.   *14*

3. Discuss the general design principles, design criteria and design requirements of elevated water tank as per Indian codal provisions (B.I.S).   *14*

BICEE-011   1   P.T.O.

4. Explain in detail the basic concept in design of earthquake resistant bridges and design of bearings with neat sketches. *14*

5. Explain with suitable sketches, the design principles of towers and chimneys. *14*

6. (a) Explain the general principles in building equivalent static analysis. *7*

   (b) Explain the vertical distribution of seismic forces and horizontal shear in building. *7*

7. An elevated water tank has a capacity of 600 m^3. The tank is rectangular 12 m × 9 m in size and 6 m in height. The tank is supported on a concrete staging 16 m in height. The staging consists of columns, horizontal and diagonal bracings. The structure is located in Zone IV and founded on a Type II medium type of soil. Let the weight of the empty tank be 250 t. The weight of the tank when it is full of water is 600 t. Let the weight of staging be 150 t, and stiffness of the staging in any direction is 3200 t/m. Find the fundamental time period when the

   (i) tank is empty.

   (ii) tank is full. *14*