B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

June, 2015

00556

BICEE-011 : EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any five questions. Use IS 1893 – 2002 and IS 13920 – 1993. Use of scientific calculator is allowed. Assume any missing data.*

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

   (a) Design principle and design criteria of elevated water tank

   (b) Raleigh wave and Love wave

   (c) Hydrodynamic pressure in tanks

   (d) Design principles of retaining walls

2. Differentiate between magnitude and intensity of earthquake. What are primary and secondary waves ?   *14*

3. Explain in detail the different methods of ductile detailing of flexural members as per IS : 13920 – 1993 codal provisions.   *14*

4. Explain with suitable sketches the design principles of chimneys and water tanks.   *14*

5. (a) Explain the design spectrum and dynamic analysis in building. 7

(b) Explain the principle of seismic weights and modal analysis. 7

6. (a) Explain the general features of IS : 1893 – 2002 in relation to earthquake resistant design of structures. 7

(b) Explain the general principle in building equivalent static analysis. 7

7. A five-storeyed RCC office building is to be constructed in seismic zone III. The lumped mass at each floor is given in Figure 1. The building is without bracing or shear walls. Assume $c = 0.62$, $\beta = 1.0$, $\alpha_0 = 0.04$. Find the total base shear along the height of the building. 14
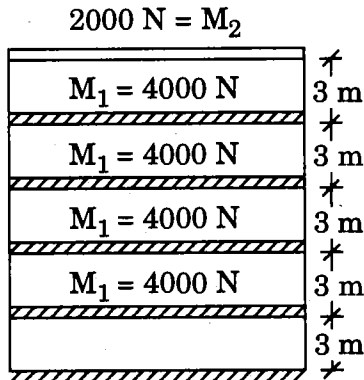

$$2000\ N = M_2$$

$M_1 = 4000\ N$	3 m
$M_1 = 4000\ N$	3 m
$M_1 = 4000\ N$	3 m
$M_1 = 4000\ N$	3 m
	3 m

Figure 1