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BICEE-011

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

December, 2017

00762

BICEE-011 : EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. All questions carry equal marks. Use of IS : 1893 – 2002 is allowed. Assume any missing data suitably. Use of scientific calculator is permitted.*

1. (a) Derive the expression for a SDOF undamped free vibration system. *8*

(b) Explain Seismograph with a neat sketch. *6*

2. (a) Explain equivalent static analysis method for a regular building subjected to earthquake forces. *7*

(b) Briefly explain Elastic Rebound Theory. *7*

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

4. A four-storey building is shown in Figure 1. The lumped weight due to dead loads is 12 kN/m^2 on floors and 10 kN/m^2 on the roof. The floors are to cater for a live load of 4 kN/m^2 on floors and 1·5 kN/m^2 on the roof. Determine design seismic load on the structure.

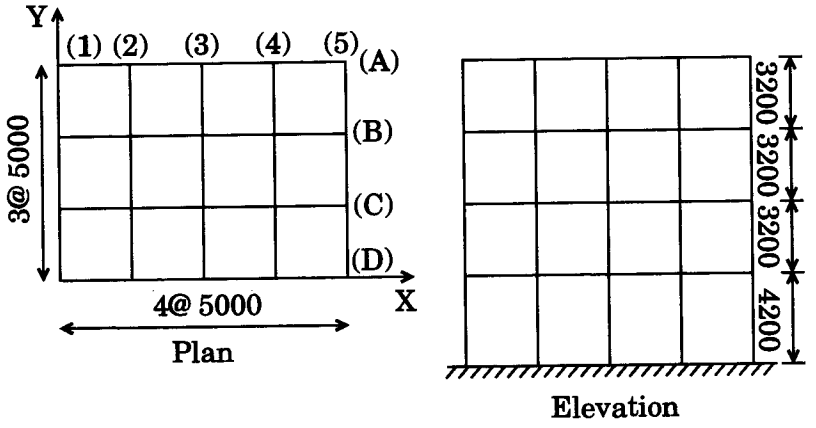

Figure 1

The building is located in Zone V. Soil condition is medium stiff.

Foundation type : Raft

Importance factor : 1

Type of frame : Special moment resisting frame *14*

5. Write short notes on the following :

(a) Magnitude and Intensity of Earthquake *7*

(b) Seismic Waves *7*

6. Write short notes on the following :

(a) Ductility Factor 5

(b) Dynamic Analysis of Structures 5

(c) Ductile Detailing of Foundation and Column 4