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BICEE-011

B. TECH. (CIVIL ENGINEERING)
(BTCLEVI)
Term-End Examination
June, 2019

BICEE-011 : EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

Time : 3 Hours *Maximum Marks : 70*

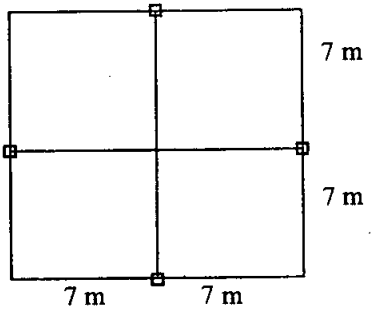
Note : *Attempt any **five** questions. All questions carry equal marks. Use of IS : 1893-2002/2016 is allowed. Assume any missing data suitably.*

1. A three-storeyed symmetrical RC school building is situated at Bhuj with the following data :

Total wt. of beams in a storey	= 130 kN
Total wt. of slabs in a storey	= 250 kN
Total wt. of columns in a storey	= 50 kN
Total wt. of walls in a storey	= 530 kN
Line load	= 130 kN
Wt. of terrace floor	= 655 kN

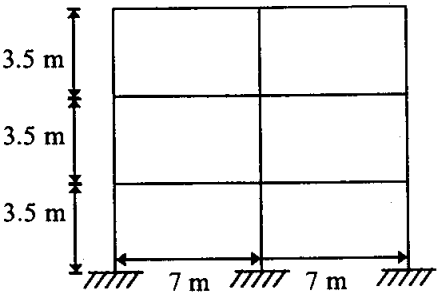
The structure is resting on hard rock, SMRF–special moment resisting frame. Calculate

design seismic load by equivalent static load method. 14



PLAN

Fig. 1 (a)



ELEVATION

Fig. 1 (b)

(**Note** : Fig. 1 is self-explanatory).

2. Write short notes on the following :

(a) Degree of freedom 5

(b) Elastic rebound theory 5

(c) Magnitude of an earthquake 4

3. (a) During an earthquake, the maximum amplitude recorded at a site by Wood-Anderson Seismograph is 20 cm.

The maximum ground velocity recorded was 25 cm/s. The site was found to be 75 km away from the epicenter. Determine the magnitude and intensity of the occurred earthquake. 10

(b) What is the importance of ductility in earthquake resistant structures ? 4

4. (a) What are seismic waves ? Discuss in detail all types of waves. 10

(b) How is hydrodynamic pressure calculated in tanks ? 4

5. (a) Give the step by step procedure to determine the fundamental time period of a chimney. 7

(b) What are the various factors in seismic analysis of structures ? 7

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

(b) Compare the equivalent lateral force and response spectrum analysis procedure for earthquake resistant design. 6