

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (CE) (Sem.-6)**  
**ELEMENTS OF EARTHQUAKE ENGINEERING**

Subject Code : BTCE-602

M.Code : 71083

Date of Examination : 05-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Answer briefly :**

- a) Define centre of mass and rigidity.
- b) What is under damped system?
- c) Draw mathematical model for any two structural system.
- d) How many seismograph stations are needed to locate epicentre of an earthquake?
- e) Which are the most destructive waves?
- f) Write D' Alembert's equation of motion.
- g) What is shear wall?
- h) What are non-engineered constructions?
- i) Which type of wave is slowest?
- j) Which observations may indicate a forthcoming destructive earthquake?

## SECTION-B

2. Explain various methods of measurement of earthquakes.
3. What are various lateral load resisting systems? Explain.
4. Explain Tectonic plate theory, enumerate 7 major Tectonic plates.
5. For under mentioned loads:
  - a) A suddenly applied force
  - b) Half sine wave load

Derive expressions for dynamic amplification factor for Single Degree of Freedom System.

6. Define seismology. Show a typical seismograph. Explain its working

## SECTION-C

7. Sketch neatly the detailing of reinforcement for two-way three storey portal frame located in zone IV of our country.
8. Discuss effect of structural irregularities on the performance of RC buildings during earthquakes.
9. A vibrating system consisting of a weight of  $W=10 \text{ lb}$  and a spring with a stiffness  $k=201 \text{ lb/in}$  is viscously damped so that the ratio of two consecutive amplitudes is 1.00 to 0.85. Determine:
  - a) Natural Frequency of the Undamped System.
  - b) The Logarithmic Decrement.
  - c) Damping Ratio.
  - d) Damping Coefficient.
  - e) Damped Natural Frequency

**NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC against the Student.**