

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE-  
RAIGAD-402103**

**Regular Summer Semester Examination – Summer 2022**

**Course: M. Tech.**

**Branch : Civil structural Engg.**

**Semester: II**

**Max Marks: 60**

**Subject Name: Earthquake engineering and design  
of earthquake resistant structures**

**Subject Code: CVSE-E4/02**

**Date: 29-10-2022**

**Duration: 3 Hr.**

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**Instructions to students**

1. **Each** question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answer with **neat sketches**, extra wherever necessary.
4. Use of **IS-1893** only is allowed.
5. If some part or parameter is noticed to be missing, you may **assume** it and mentioned it clearly.

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Q1. Write on (Any two) (12)

- (a) Theory of plate Tectonics, Different Plates and different plate boundaries depending on relative movements.
- (b) Strong motion characteristics of Earthquakes.
- (c) Types of seismic waves and their mode of propagation.

Q2. Write on (Any one) (12)

- (a) Derive the solution for response of SDOF system to Harmonic Loading.
- (b) Response spectrum, Design response spectrum, combined D-V-A response spectrum (Tripartite plot).

Q3. Write on (Any one) (12)

- (a) Vertical and plan irregularities in buildings.
- (b) Mathematical model of RC building with floor diaphragm and soil foundation.

Q4. The plan and elevation of a three storied RC school building is shown in Fig 1(a) and 1(b). The building is located in zone V, having medium soil. The intensity dead load including infill is  $10 \text{ kN/m}^2$ . It is proposed to design the building as a special RC moment resisting frame (SMRF). Determine the design seismic loads by static analysis. (12)

Q5. Write on ( Any one) (12)

(a) What is ductility? What are the different types of ductility? What are the factors that affect ductility?

(b) Show with neat sketch the ductile detailing in beam as per IS-13920

Q6. Write on (Any one). (12)

(a) Base Isolation Technique

(b) Seismic Retrofitting.

