

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TERM 1 EXAMINATIONS–2023

M.Tech.–II Semester (Structural Engineering)

COURSE CODE (CREDITS): 12M1WCE213 (3)

MAX. MARKS: 15

COURSE NAME: Earthquake Resistant Design of Structures

COURSE INSTRUCTORS: Sugandha Singh

MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

1. What are plates in the Earth's land mass? Discuss the different types of plate boundaries. [3]
2. Explain the Elastic Rebound Theory for earthquake occurrences. What is the application of this theory in seismic hazard analysis? [3]
3. What are the differences between the following terms? [4]
 - a. Fourier Acceleration and Ground Motion Response Spectrum [2]
 - b. Magnitude and Intensity of an Earthquake [2]
4. Ground motion at a site can be described as $\ddot{u}_g(t) = 5 \sin 10t \text{ m/s}^2$. Find the following for the ground motion response spectrum related to the ground motion. Assume damping ratio as 5%. [5]
 - a. Peak frequency in cycles/s [1]
 - b. Peak spectral acceleration in 'g' units [2]
 - c. Peak spectral displacement in 'mm' [1]
 - d. Zero period acceleration in 'g' units [1]