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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

M.Tech-II Semester (SE)

COURSE CODE (CREDITS): 25M11CE212 (3) MAX. MARKS: 15

COURSE NAME: Earthquake Resistant Design of Structures

COURSE INSTRUCTOR: Mr. Chandra Pal Gautam MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculators is allowed

Q.No	Question	CO	Marks
Q1	(i) Explain Plate Tectonic Theory and the reason behind the earthquake on earth. (ii) Define following terms: Epicentre, Focus, intensity and magnitude of earthquake. (iii) Define different types of seismic waves and their properties.	CO-1	2+2+2 = 6
Q2	Explain various reasons for the devastating damage in RC buildings during Bhuj earthquake in 2001 with proper reasoning.	CO-1	3
Q3	An earthquake is recorded at a seismograph station with a P-S wave arrival time difference of 3 seconds (P-wave velocity = 8 km/s, S-wave velocity = 4.5 km/s). The event has a Richter scale magnitude of 6.2 based on maximum wave amplitude. (a) Calculate the approximate epicentral distance from the station using the time difference. (b) If the reference amplitude A0, corresponds to magnitude 0, and this event's amplitude A=1,584,893×A0, find the magnitude of the earthquake. (c) Another station records the same event with Richter magnitude 6.8. Using the comparison formula, determine how many times more intense this reading is compared to the first station's measurement. (d) Estimate the moment magnitude Mw, for this event, given fault rupture dimensions of 80 km length × 40 km width, average slip of 1.5 m, and shear modulus μ=30 GPa.	CO- 2	6

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