


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, May 2022			
Programme Name: M.Tech. Structural Engineering		Semester : II	
Course Name : Seismic Design of Structures		Time : 03 hrs	
Course Code : CIVL 7013		Max. Marks : 100	
Nos. of page(s) : 2			
Instructions: Answer all questions of Section A, B & C			
IS 1893, IS 456, IS 13920, SP 16 Should be allowed or Provided			
SECTION A			
S. No.		Marks	CO
Q 1	Discuss about the vertical irregularities that affect the performance of RC buildings during earthquake.	4	CO1
Q 2	Write the major types of plates in engineering seismology.	4	CO1
Q 3	Outline about body waves and surface waves.	4	CO1
Q 4	Illustrate about seismic hazards	4	CO1
Q 5	Write in detail about strong earthquake motion.	4	CO1
SECTION B			
Q 6	Explain, seismic retrofitting of RC building with bracing and Shear wall	10	CO4
Q 7	Seismic retrofitting of RC building with jacketing and Shear walls. Explain	10	CO4
Q 8	Design Beam for the frame discussed in Q 10.	10	CO2
Q 9	Design Column for the frame discussed in Q 10.	10	CO2
SECTION-C			
Q 10	A three storied symmetrical RC school building situated at Dehradun with following data: Plan dimension : 7 m Storey height : 3.5 m Total weight of beams in a storey : 130 kN Total weight of slabs in a storey : 250 kN Total weight of columns in a storey : 50 kN Total weight of walls in a storey : 530 kN	20	CO2

	Live load : 130 kN Weight of terrace floor : 655 kN The structure is resting on hard rock. Solve for the total base shear and lateral loads at each floor level for 5% of damping using seismic coefficient method.		
Q 11	Design a shear wall for 14 stored reinforced building with reinforced concrete building as per the design requirement of IS 13920. Assume relevant data if any needed.	20	CO3