BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH CIVIL **SEMESTER : VI**
BRANCH: CIVIL **SESSION : SP/2025**

SUBJECT: CE210 EARTHQUAKE ENGINEERING AND DISASTER MANAGEMENT

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:

1. **The question paper contains 5 questions each of 10 marks and total 50 marks.**
2. **Attempt all questions.**
3. **The missing data, if any, may be assumed suitably.**
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. **Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**
6. **Code book is allowed for question 3(b).Refer to Code book: IS-1893 (Part-1): 2016.**

			CO	BL
Q.1(a)	Using suitable examples , discuss the concept of Disaster, Risk, Impact, Vulnerability and Capacity Development	[5]		
Q.1(b)	Write a short note on the followings: a) Different plate boundaries [1m], b) Seismic waves [1m], c) Difference between Body waves and surface waves [1.5m], d) Difference between Rayleigh waves and love waves [1.5m]	[5]	1	1
Q.2(a)	Find the natural frequency of the system shown below. Take k_1 = 2 kN/m, k_3 = 3 kN/m. (Refer to Fig. 2A)	[3]	1	3

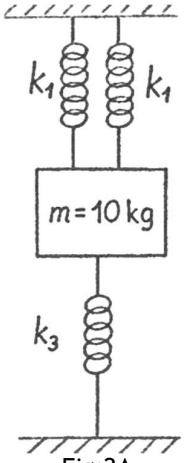

Fig:2A

Q.2(b)	Find the natural frequencies and modes of vibration for the system shown below: (Refer to Fig. 2B)	[7]	1	3

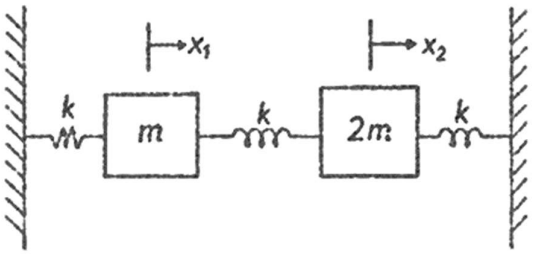

Fig:2B

PTO

Q.3(a)	What are the four virtues of earthquake resistance building?	[5]	3	2
Q.3(b)	An 8-storey RCC concrete school building (having Special Moment Resisting Frame with masonry infill) has plan dimensions as shown in the given figure. The storey height is 3.3 m. The DL per unit area of the floor is 4 kN/m 2 . The intensity of live load on each floor is 3 kN/m 2 and on the roof is 1.5 kN/m 2 . The soil below the foundation is medium stiff and the building is located in Shillong. Determine the design base shear for the building as per the equivalent static method of IS-1893 (Part-1): 2016. (Refer to fig. 3B)	[5]	3	3

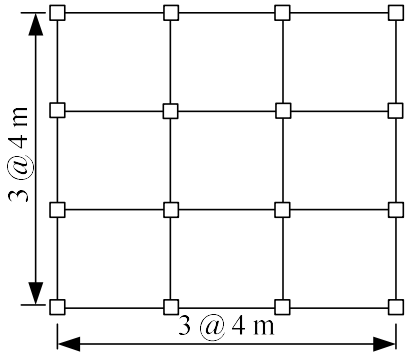

Fig: 3B

Q.4	Explain the concept of ecological fragility? Discuss the factors that induce fragility in Coastal Ecosystems and mechanisms to manage them.	[10]	4	4
Q.5(a)	What are the components of Disaster Preparedness Plan	[5]	5	5
Q.5(b)	Draft a Preparedness Plan for recent Forest fires that occurred within BIT Premises	[5]	5	5

::::::30/04/2025::::::M