

Hall Ticket Number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code No. : 42022B

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (Civil Engg.) IV Year II-Semester Main Examinations, May-2019

Elements of Earthquake Engineering
 (Elective-III)

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Q.No.	Stem of the question	M	L	CO	PO
Part-A (10 × 2 = 20 Marks)					
1.	Explain the purpose of Modified Mercalli scale	2	2	1	1
2.	Explain the effect of strong ground motion on structures	2	2	1	1
3.	Define an underdamped system.	2	1	2	1
4.	Compute the fundamental time period of an SDOF system with a natural frequency of 3.5 radians/sec.	2	2	2	2
5.	Explain the importance of conceptual design in the seismic resistant design of structures.	2	1	3	1
6.	Explain the significance of importance factor in the earthquake resistant design of structures.	2	2	3	1
7.	Explain the significance of Bihar-Nepal earthquake?	2	2	4	1
8.	Define reservoir-induced seismicity and cite an example.	2	2	4	1
9.	List various methods of seismic retrofitting of buildings.	2	2	5	1
10.	State the purpose of energy dissipation devices	2	2	5	1
Part-B (5 × 10 = 50 Marks)					
11. a)	Explain under what conditions soil liquefaction takes place.	5	2	1	1
b)	Outline various types of waves produced due to earthquakes.	5	2	1	1
12. a)	Derive an expression for the forced vibration response of an underdamped single degree of freedom (SDOF) system.	5	3	2	2
b)	Explain how response spectrum is used in the seismic resistant design of structures.	5	3	2	2
13. a)	Explain various aspects of conceptual design to be followed in the planning and design of buildings to resist earthquakes.	5	2	3	2
b)	Explain the importance of over strength and zone factor in seismic resistant design.	5	3	3	2
14. a)	Discuss the damage to structures caused by Bhuj earthquake	5	3	4	2
b)	Outline the importance of Uttarkashi earthquake	5	3	4	2
15. a)	Explain the importance of base isolation techniques.	5	3	5	2
b)	Explain seismic retrofitting and outline how structures damaged during an earthquake are retrofitted.	5	3	5	2

16. a) Explain the importance of plate tectonics in understanding earthquakes.	5	1	1	2
b) Derive an expression for logarithmic decrement.	5	2	1	2
17. Answer any <i>two</i> of the following:				
a) Explain the importance of ductility in the earthquake resistant design of structures	5	3	3	2
b) Explain the seismic zones of India and their importance in the earthquake resistant design of structures.	5	1	4	2
c) Explain how jacketing of columns is carried out.	5	3	5	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	64
2	Knowledge on application and analysis (Level-3 & 4)	36
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	---

