

Code No: 138BU**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year II Semester Examinations, September - 2020****ELEMENTS OF EARTHQUAKE ENGINEERING****(Civil Engineering)****Time: 2 Hours****Max. Marks: 75****Answer any Five Questions
All Questions Carry Equal Marks**

- 1.a) A SDF system having viscous damping has a spring of stiffness 500 N/m. When the weight is displaced and released the period of vibration is 2 s and ratio of successive amplitudes is 4 to 1. Determine the Amplitude of the motion and the Phase-angle when a force is applied to the system?
- b) What are the probable causes of earthquakes? Briefly discuss any two theories in regard to the prediction of earthquakes. [8+7]
- 2.a) Derive expression for response of a SDOF system subjected to damped free vibration.
- b) Describe the theory of plate tectonics and also four major scientific developments by the theory. [7+8]
- 3.a) Explain briefly the factors that influence the analysis and design of earthquake resistant structures.
- b) Identify and discuss the plan configuration problems to structural damage in structures during strong earthquakes. [7+8]
- 4.a) Explain base isolation and list out various base isolation and vibration energy dissipating devices.
- b) Distinguish between centre of rigidity and centre of mass and their importance in seismic analysis. [7+8]
- 5.a) Discuss effect of structural irregularities on the performance of RC buildings during Earthquakes.
- b) Explain the equivalent lateral force procedure for evaluating base shear according to IS code 1893. [8+7]
- 6.a) Write various steps to compute dynamic response of a structure by model superimposition techniques with response spectrum method.
- b) Give the details of lateral force resisting systems approved by the code IS 1893 (Part1) :2002. [8+7]
- 7.a) Explain how the infill walls makes the structure earthquake resistant and also explain the various modes of failure of infilled frame.
- b) Explain the analysis of infilled wall using equivalent diagonal strut for infill with and without openings. [8+7]
- 8.a) Explain the ductile detailing of compression members as per IS 13920.
- b) With the help of an example discuss the seismic design procedure of a shear wall. [7+8]

---ooOoo---