Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14CE3007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SEISMIC DESIGN OF STRUCTURES** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. |  | Explain the Conceptual design considerations of earthquake resistant structural system. | CO1 | 20 |
| (OR) | | | | |
|  |  | Briefly explain the following with neat sketches. |  |  |
| 2. | a. | Elastic rebound theory. | CO1 | 5 |
| b. | Different types of seismic waves. | 5 |
| c. | Magnitude and Intensity. | 5 |
| d. | Plate tectonics. | 5 |
| 3. |  | A three story steel building is located in seismic zone III on soft soil. The framing system of the building is special moment-resisting frame without brick masonry infill panels. Find the base shear and its distribution along the height of the building. Column sections: ISHB 450 @872N/m, Beam sections: ISMB 400 @616 N/m Slab: 125mm thick RCC slab on all floors. Size of building 30x30m, Height of each floor - 5m, Live load - 2.5kN/m2. Assume the relevant data. | CO1 | 20 |
| (OR) | | | | |
| 4. | a. | Write short notes on soil structure interaction. | CO3 | 10 |
|  | b. | Describe the siesmic behaviour of masonry wall with neat sketches. | CO3 | 10 |
| 5. |  | Write the general ductile design and detailing considerations of beam and column as per IS 13920. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Design the beam for the following data as per IS 13920  Dead load - 20kN/m, Live load - 15kN/m, Bending moment for seismic load - 100kNm, Shear force for seismic load - 70kN, M25 concrete and Fe415 steel. | CO1 | 20 |
| 7. | a. | Explain in detail the concept of Nonlinear time history analysis of structures. | CO3 | 10 |
|  | b. | Examine the seismic behaviour of steel structures with neat sketches. | CO3 | 10 |
| (OR) | | | | |
| 8. |  | Design the shear wall for the following data, height of the wall 4.5m  M30 concrete, Fe415 steel. Thickness of the wall - 250mm, Size of the boundary element - 300x750mm.   |  |  |  |  | | --- | --- | --- | --- | |  | Axial load (kN) | Moment  (kNm) | Shear (kN) | | DL+LL | 1500 | 400 | 50 | | Seismic load | 200 | 3000 | 800 | | CO1 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | Explain different types of base isolation techniques with examples. | CO2 | 20 |

ALL THE BEST