Code No: 138BU **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, December - 2020
ELEMENTS OF EARTHQUAKE ENGINEERING
(Civil Engineering)

Time: 2 Hours **Max.Marks:75**

Answer any Five Questions
All Questions Carry Equal Marks
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1. Explain the various earthquake magnitude scales. [15]

2. A damped SDOF system of weight W = 600 kN is set into free vibrations by releasing it from an initial displacement of 60 mm. Given that the maximum displacement after one complete oscillation is 45 mm and it occurs in 0.75 sec.
   Find the following:
   a) Logarithmic decrement b) Damping ratio
   c) Undamped natural frequency d) Stiffness of the system and
   e) Damping coefficient. [15]

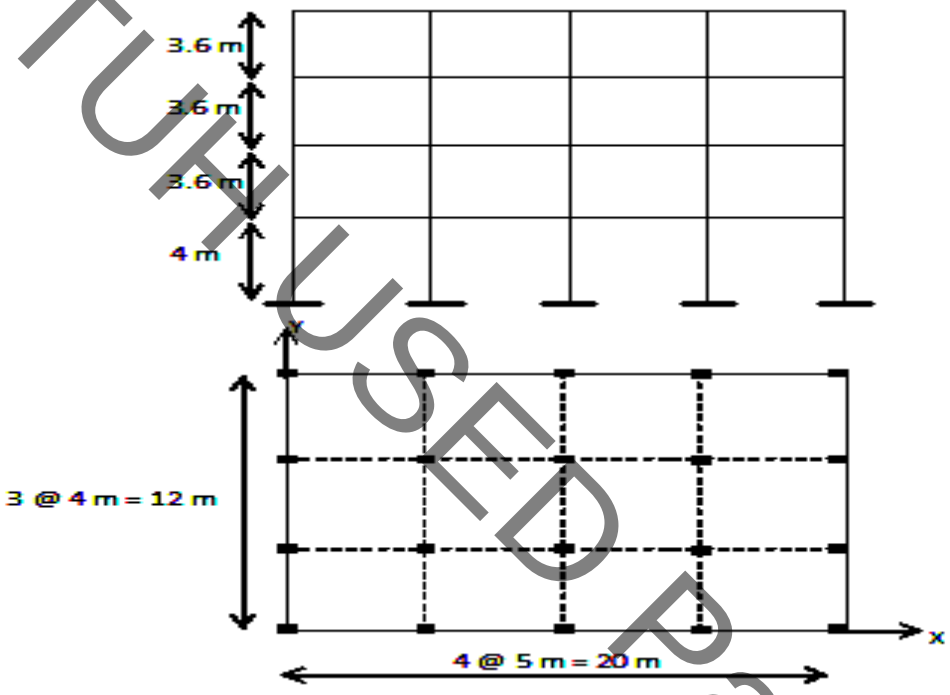
3. Explain the various architectural parameters influencing the behavior of an earthquake resistant building. [15]

4. Explain the factors effecting the choice of materials for the construction earthquake resistant buildings. [15]

5. Explain the various factors influencing the seismic retrofitting of buildings. [15]

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6. Using equivalent static method, determine the design seismic load on each frame of a four-storeyed reinforced concrete residential building, plan and elevation, shown in figure. The building is to be constructed in Chennai. The soil is medium soil. The reinforced concrete frames are to be filled with brick masonry. The lumped weight due to dead load is 1kN/sq.m on floors and 2 kN/sq.m on roof. The live load on the floors is 3 kN/sq.m and 1 kN/sq.m on roof. The cross-sectional dimensions of beams and columns are 230 mm × 350 mm and 230 mm × 450 mm, respectively. [15]



7. Explain the step-by-step procedure for the lateral load analysis of masonry buildings. [15]

8.a) Draw and explain the ductile detailing provisions of an RCC Column.
b) Explain the vulnerability of short columns of buildings during earthquakes. [7+8]

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