

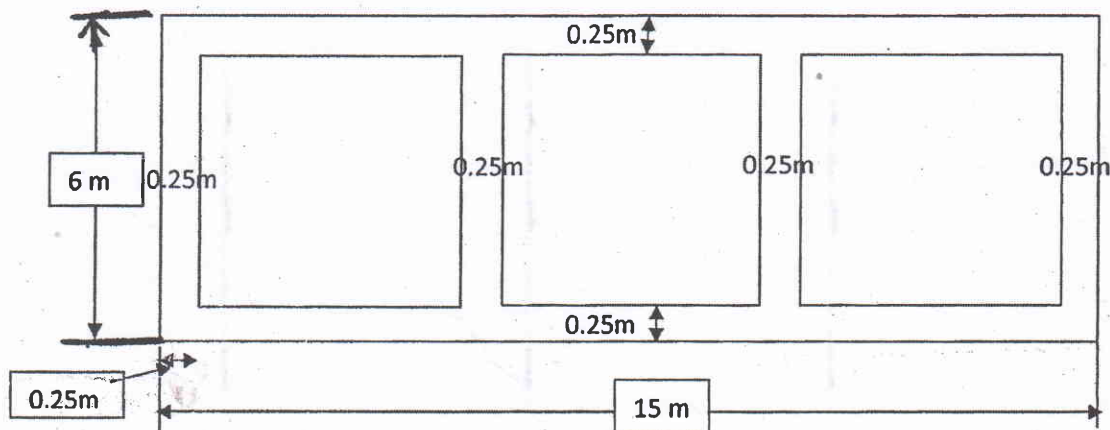
5 D TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2073 Bhadra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Vulnerability Assessment and Retrofitting Techniques (*Elective II*) (CE76504)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt **All** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

- What are the causes of earthquake? Differentiate between the seismic risk and seismic hazard. [3+5]
- Explain the type of seismic evaluation methods with flow chart. [7]
 - Describe the steps in qualitative assessment method of the existing buildings with suitable examples. [10]
- Write down the compliance criteria of major vulnerability factors for the load bearing masonry building. [10]
- Define the Non-destructive, Semi destructive and destructive tests. Differentiate between Rebound Hammer Test and Ultrasonic Pulse Velocity Test on the basis of their objectives and limitations. [6+7]
- Calculate the Base shear as per NBC of the single storey load bearing masonry building as shown below. The height of storey is 2.84 m. Wall thickness is of 0.25 m for each wall and slab thickness of 0.125 m. Also check in torsion and suggest that it is compliance or not as per its requirement? [10+7]



- List and describe about the retrofitting techniques of RCC Frame Structures. Also write down the construction steps for Beam Jacketing and Column Jacketing option of retrofitting. Sketches are compulsory. [10+5]
