Paper Code: STR-31B	**Roll No.**										

M. TECH.
THIRD SEMESTER EXAMINATION, 2016-17
MASONRY STRUCTURES

[Time: 3 Hours] [Total Marks: 100]

Note: Attempt ALL questions.

1. Attempt any *FOUR* parts of the following:- **(5x4=20)**

(a) Discuss the behavior of brick walls during earthquake.
(b) What do you understand by box action? Discuss.
(c) Why vertical reinforcement provided in earthquake resistant brick masonry?
(d) What are the different category of buildings as per IS: 4326 ? Write the basis of category of the building.
(e) Give the reasons of the poor performance of masonry building in earthquake.

2. Attempt any *TWO* parts of the following:- **(10x2=20)**

(a) Describe the various earthquake resistant features that can be introduced in a masonry building to make it earthquake resistant.

(b) How can the rocking of masonry piers in a masonry wall be prevented?

(c) Determine the frequency and design seismic coefficient for an ordinary masonry shear wall in a hospital building in Gorakhpur , given the following data.
Roof load = 20 KN/m, height of wall = 3.0 m, width of wall = 0.23 m,
The building is situated on rocky soil. Density of masonry wall = 20 KN/m^3

3. Attempt any *TWO* parts of the following:- **(10x2=20)**

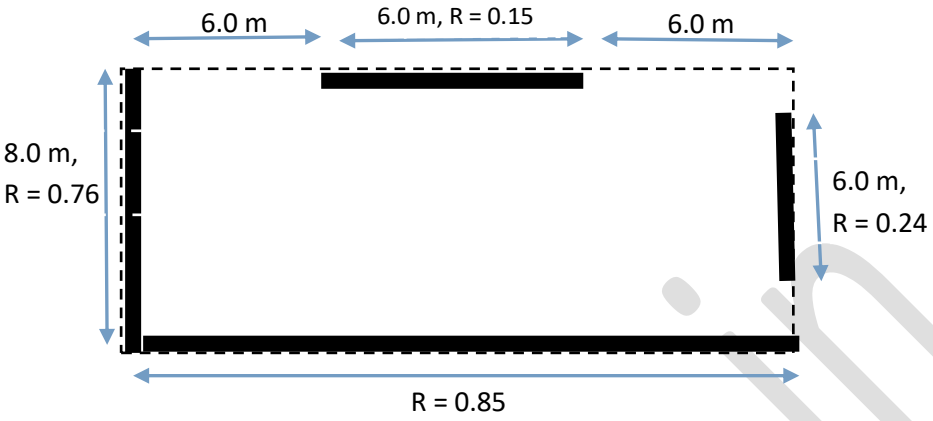
(a) For a room of 8 mx5 m internal dimension, walls are constructed with 230 mm thick wall. The load on roof is 8 KN/m^2 . design the lintel band for the given data:
Design seismic coeff. = 0.16, wall height = 4.0 m, lintel height from plinth = 2.1 m Density of masonry wall = 20 KN/m^3

(b) Design an unreinforced 6 m high and 5 m wide masonry shear wall with roof height 5.5 m. prism strength of masonry = 10 MPa, seismic force at roof level = 30 KN, no superimposed load is applied on the wall.

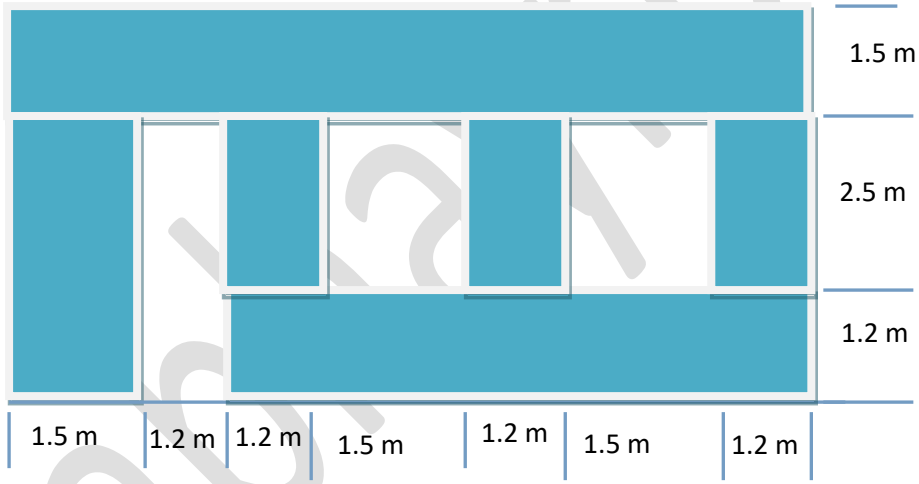
(c) Determine the lateral forces on a two story unreinforced brick masonry building for the data; plan size = 20 m x 10 m, storey height = 3.0 m, weight of roof = 2.5 KN/m^2, weight of wall = 5 KN/m, LL on floor = 4 KN/m^2
Zone = III, Medium soil, school building.

4. Attempt any *ONE* part of the following:- **(20x1=20)**

(a) Calculate the torsional shear force in a one storey shear wall masonry structure with a rigid diaphragm roof for the following data. Height of the parapet wall = 0.9 m, floor level = 3.0 m, zone = IV, I = 1.0, Sa/g = 2.5
Self weight of roof = 3.5 KN/sq m, self weight of wall = 7.5 KN/m, base shear = 400 KN



(b) Determine the rigidity of the shear wall in terms of Et.



5. Attempt any *FOUR* parts of the following:- **(5x4=20)**

(a) What are the typical problem that are frequently encountered due to deterioration of existing masonry building?
(b) What are the deficiencies in masonry building for resisting seismic loads?
(c) Discus the retrofitting techniques to strengthen brick walls.
(d) Write the steps to provide lintel band in the existing building.
(e) Write the steps to provide vertical reinforcement in the existing building.