Q.1 Discuss in brief any five failure mechanism of a masonry buildings.

$5 \times 1\frac{1}{2} = 7\frac{1}{2}$

Ans. (a) OUT OF PLANE FAILURE :→ when the wall is transverse to the direction of earthquake force it behaves as a weak wall and may topple down very easily. [Plane of force & wall is different]

(b) IN PLANE FAILURE :→ when the wall is in the direction of earthquake force, it gives good resistance to all against the earthquake forces. [Plane of force & wall is same].

(c) CONNECTION FAILURE :→ This type of failure occurs at the corner connection bet^n the wall or between wall & roof. Due to EQ force connection breaks & damage occurs.

(d) FAILURE DUE TO OPENING IN WALL :→ when opening in wall provided for either door or window, it reduces the stiffness of the wall & weaker plane is created. Secondly these opening should not be close to corners.

(e) POUNDING :- when there is a height difference in the adjacent buildings, then during EQ forces lower level wall exerts a pressure on adjacent high wall, this action is called pounding.

Q.2 Write in short the three main damages of stone buildings.

$3 \times 1\frac{1}{2} = 4\frac{1}{2}$

Ans. (a) Separation or bulging of walls in the horizontal direction The thick stone masonry wall get separated into two vertical wythes (layers) due to absence of a through stone.

(b) Separation of wall at T junctions & corners due to poor connection bet^n the walls.

(c) The separated wythes gets collapsed under heavy load of roof slab.

Q.9 Write any three non engineered R.C. buildings damages. ③

(a) Sliding of roof off the supports :→ The roof gets slip on the supports and hence failure takes place.

(b) Falling of walls :- Due to Eq force the wall of the building falls down due to weak bonding betⁿ the column & wall and wall & roof.

(c) Pulling out of Reinforcing bars. :- In many buildings reinforcing bars are pulled out of either column or beam due to inadequate development length or weak knots of shear stirrups.

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