NAME: M. MUSTAFA . KHAN
ID : 7753
SEC: A
DEPARTMENT: CIVIL ENGINEERING
SEMESTER : 8TH
PAPER : EARTH QUAKE ENGINEERING

QUESTION # 1:

=> in figure no1 the building is collapsed due to soft story effect and it is due to the change of stiffness in lower story the rest of the story. the more stiff more it take loads.

=> in figure no2 the configurat -ion is not good because their are alot of corners or alot of structural member attached so their should be building separate joint.

=> in figure no3 it has same case of figure no2 it also have reentraint corners which is critical during earth quake

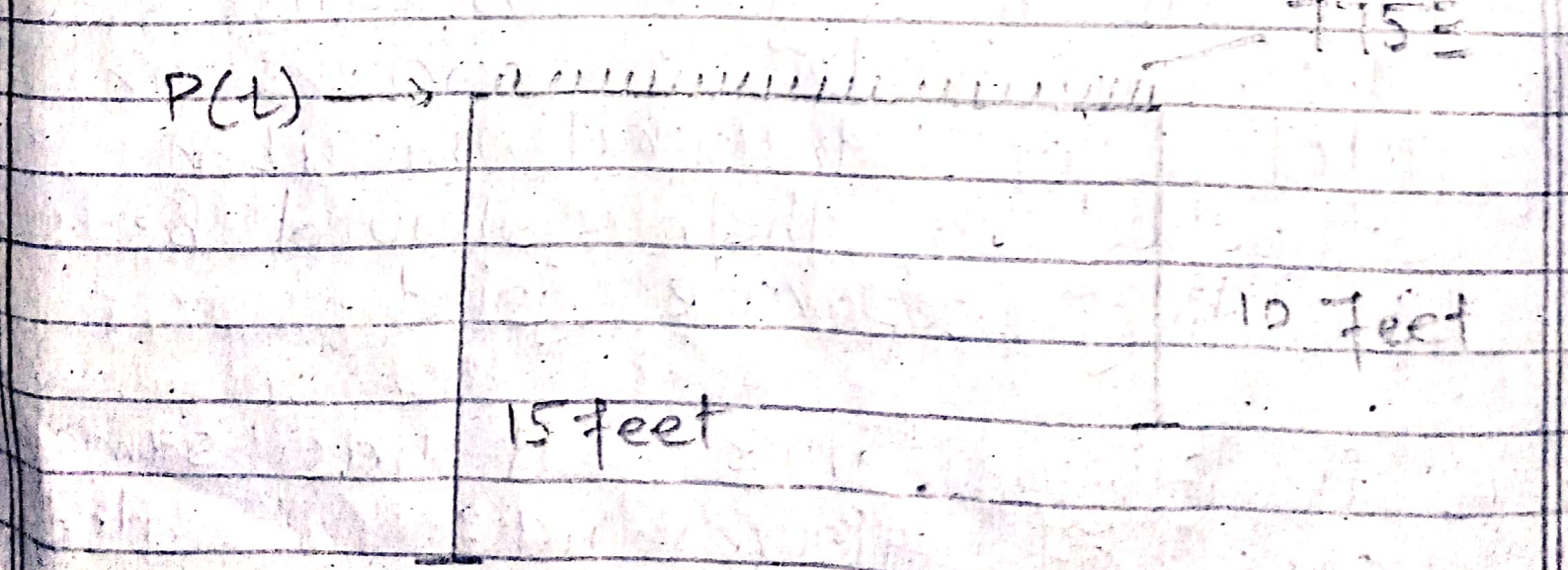
and also the columns are shortened due to presence of walls which has made it more stiffer thus it take more load and hence collapse

Sollution for these Pooblems:

Rectraint

corners should not be present in a building should be modeled as rectangular and square arrangement columns should be continued from bottom to top or vice versa and stiffness of all stories should be equal to minimize soft story effect.

QUESTION # 2:



Equation of Motion : (EOM)

general form of EOM

$$m\ddot{u} + c\dot{u} + ku = P(t)$$

As

$$\Sigma F_u = m\ddot{u}$$

$$P(t) - F_{s1} - F_{s2} = m\ddot{u}$$

$$m\ddot{u} + F_{s1} + F_{s2} = P(t) \quad - (A)$$

$$F_{s1} = \frac{12EI}{L^3} = \frac{12EI}{15^3} \quad - (1)$$

$$F_{s2} = \frac{12EI}{L^3} = \frac{12EI}{10^3} \quad - (2)$$

$$m = \frac{7753 \times 20}{g} = \frac{7753 \times 20}{32.2} = 4815.53 \quad - (3)$$

Put eq (1), (2) & (3) in eq (A)

$$4815.53 + 12EI\left[\frac{1}{153} + \frac{1}{10^3}\right]u = P(t)$$

$$4815.53 + (0.0156\,EI)\,u = P(t)$$

Required Equation.