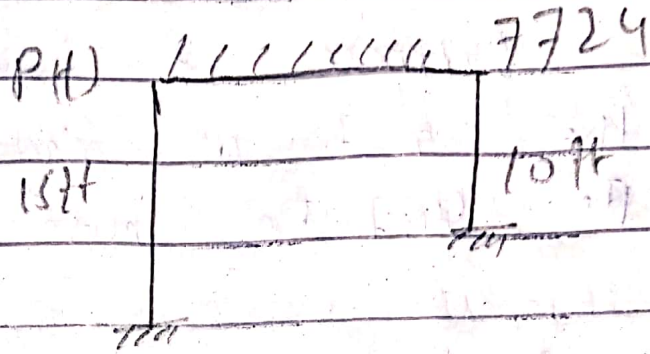


Dilraj Khar

ID : 7724

Earthquake.



Eg- of Motion

(General form)

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

$$\text{As } \sum F_t = m\ddot{u}$$

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

$$m\ddot{u} + f_{s1} + f_{s2} = P(t) \quad \text{--- (1)}$$

$$f_{s1} = \frac{12EI}{L^3} = \frac{12EI}{15^3} \quad \text{--- (2)}$$

$$m = \frac{7724 \times 20}{32.2} = 4797.51 \text{ kg} \quad \text{--- (3)}$$

Put (1) & (2) in (3)

$$4797.51\ddot{u} + 12EI \left[\frac{1}{15^3} + \frac{1}{10^3} \right] u = P(t)$$

$$4797.51\ddot{u} + (0.0156EI)u = P(t) \text{ required.}$$

Q1 Ans

In fig No 1 the building is collapsed due to soft story effect. And it is due to change in stiffness of lower story. The rest of story the more the stiff the more it take load.

— In fig 2 the configuration is not good because that there are a lot of corner or a lot of structure member attached so there should be building separator joint.

In fig 3 it has the same case as figure 02. It also have recent joint corners which is critical during earth quake and also the column are shortened due to the presence of wall which has made it more stiffer. Thus it take more load and hence collapse.

Solution For These Problem.

Reentrant corner should not be present in a building. Should be modelled as rectangular & square arrangements also. Columns should be continued continued from bottom to top or vice versa & stiffness of all stories should be equal to minimize soft story effect.