

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
First Semester (2022-23)
MIDSEMESTER TEST (02/11/2022)

Course No. CE G618

Course Title: Design of Multistoried Building

Weightage: 30 %

Duration: 90 min.

Q.1a) Explain with figure loading arrangement to obtain [3]

- ❖ maximum span moment
- ❖ maximum span moment
- ❖ maximum support shear

b) State the assumptions made in cantilever method analysis of a frame for horizontal load. [2]

c) Differentiate between characteristic load and design load. [1]

d) Write expressions for earth pressure and surcharge pressure explaining the different terms used. [2]

e) Wind load and earthquake are considered simultaneously. State true or false with proper justification. [2]

Q.2 Find out the load on interior column and exterior column of 1st storey and 3rd floor of a nine storey building. [15]

Live Load on even storey = 1500 N/m²

Live Load on odd floor = 4000 N/m²

Live Load on Roof = 2000 N/m²

Dead load of even floor = 3000 N/m²

Dead load of odd floor = 3200 N/m²

Dead Load of roof and G.F. = 2800 N/m²

Height of odd storey = 3.3 m

Height of even storey = 3.82 m

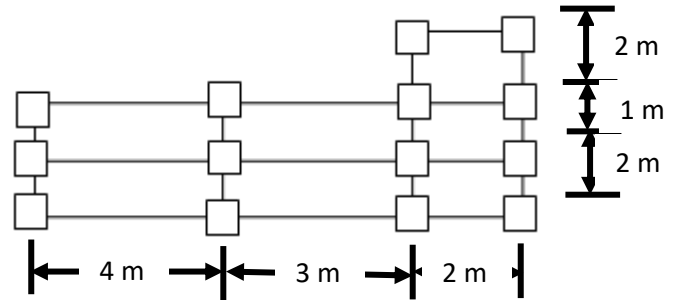


Fig.Q2

Q.3 An important four storied and unsymmetrical building in Zone IV has the plan shown in Fig.Q.3. Using IS:1893-Part (1):2016, compute the seismic weights, base shear and seismic forces on each floor. Use the following data [20]

- | | |
|---------------------|---------------------------------|
| Beam size | : 300 X 400 mm |
| Column size | : 300 X 900 mm |
| Floor slab | : 150 mm thick including finish |
| Wall Thickness | : 250 mm including plaster |
| Clear storey height | : 3m |
| Live load | : 5 kN/m ² |
| Type of Soil | : Rock |

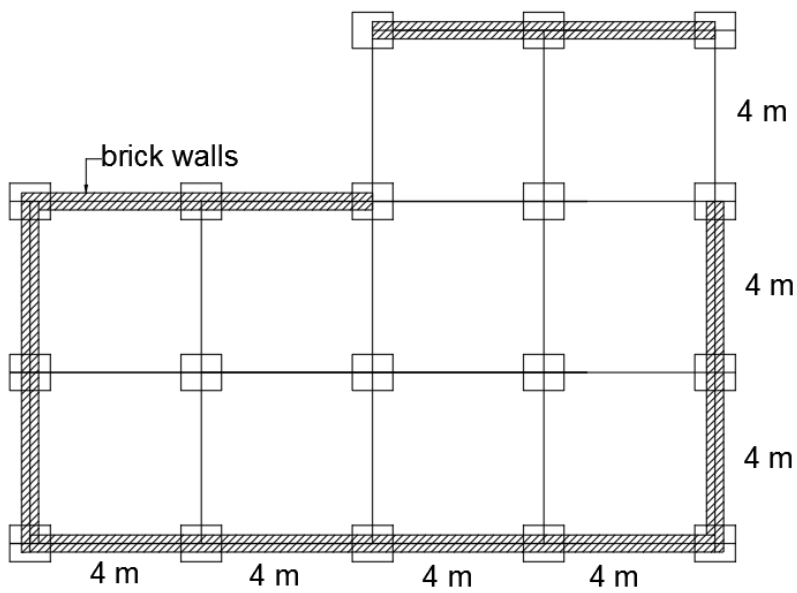


Fig.Q3

Q.4 The figure below shows the shear forces in the interior columns of a two storied frame. Use the Portal method to calculate corresponding [15]

- i) Applied loads P_1 and P_2
- ii) Column bending moments

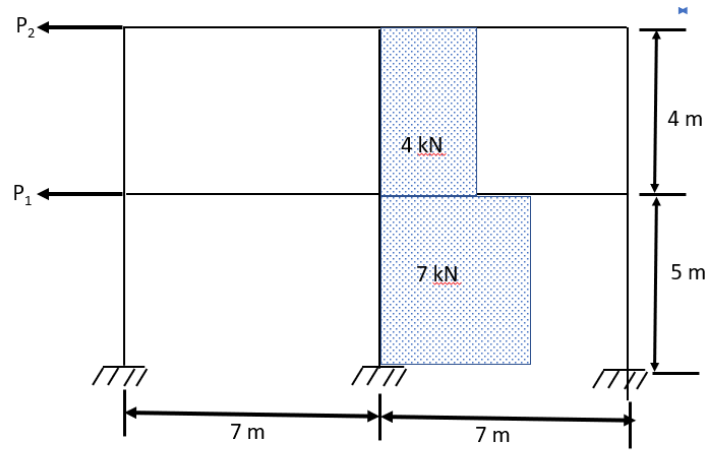


Fig. Q 4