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B. Tech. (Sem. V) (Main / Back) Examination, November 2018
Civil Engg.
5CE5A Building Design

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. IS : 875 Part-3   2. IS : 1893 Part-1

UNIT - I

1 (a) What do you understand by over turning in a building ?

6

(b) What are tube in tube structure of high rise building ?

6

(c) Explain concept of load flow to different structural components with figure.

4

OR

(a) Write different configuration of high rise buildings.

4

(b) Calculate equivalent uniformly distributed load for bending moment and shear force for a beam if load tmsferred on such beam from a slab is triangular in nature.

8

(c) Define stiffness of building and how this will affect design ?

4

5]   1   [P.T.O.

UNIT - II

2. Calculate wind load on wall and roof of a rectangular clad building with pitched roof. having plan dimensions 10 m × 50 m and height 5 m. The building is situated in Delhi in an industrial area 500 m inside open land on a fairly level topography. Walls have 20 opening of 1.5 m × 1.5 m size, if roof angle is 15°.

OR

16

2. Calculate wind load on a rectangular Clad Building with monoslope roof with overhang. Consider height (h) = 5.0 m. length (l) = 20 m. width (w) = 10 m. roof angle α = 20° and overhang is 0.5 m. ground is flat. terrain category-2. life of building 25 years and building is situated at Surat.

16

UNIT - III

3. Calculate force in given frame building with following data :
   (i)   Column size = 400 mm × 400 mm
   (ii) Beam size = 300 mm × 400 mm
   (iii) Floor thickness = 120 mm
   (iv) Live load on floor = 4.0 kN/m²
   (v)   Brick wall thickness = 150 mm
   (vi) Storey height = 4.0 m each
   (vii) No. of storeys = 5

2@5.0m

5@5.0m
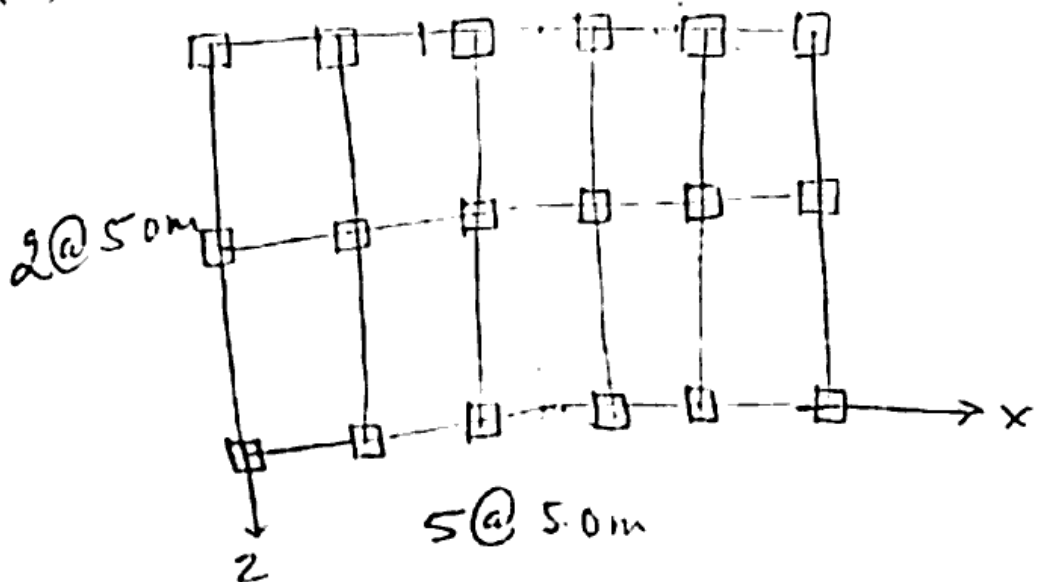
Plan of Building

OR

16

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2

| P.T.O.

3   (a)   What do you understand by centre of mass and centre of rigidity ?
                                                                                        4

     (b)   The plan of building have four shear wall. All four walls are in M25 grade
            concrete, 200 mm thick and 4 m long. Storey height is 3.5 m. Floor consists
            of cast in sita reinforced concrete. Design shear force on the building is
            100 kN in either direction. Determine the design lateral force on different
            shear walls.
                                                                                        12

UNIT - IV

4   (a)   How do you define wall and column in a masonry building. With the help
            of diagram draw effective length of walls for various cases as per code.
                                                                                        8

     (b)   Write construction practices required for ensure earthquake resistance in
            Masonry Building.
                                                                                        8

OR

4   (a)   Explain the ductile detailing in column and beam connections.
                                                                                        8

     (b)   What do you understand by slenderness ratio of wall and column in design
            of Masonry.
                                                                                        4

     (c)   Explain the behaviour of infill wall in Masonry construction.
                                                                                        4

UNIT - V

     (a)   Explain the difference between grid floor and ribbed floor and draw the
            diagram to illustrate the difference.
                                                                                        8

     (b)   Explain in detail about panels and precast elements.
                                                                                        8

OR