5E5065

Roll No. ___

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B.Tech. V Semester (Main/Back) Examination, Nov./Dec. - 2017

Civil Engineering

5CE5A Building Design

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates :

*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 suitable 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 1893 - Part I *2. IS 875 Part III*

Unit - I

1. a) What do you understand by symmetry and Asymmetry in building form? **(4)**

   b) Describe the shear wall. What are the function of shear wall. **(6)**

   c) What are the tube in tube structure of high rise buildings? **(6)**

OR

1. a) What do you understand by over turning in a building. **(4)**

   b) Write the contributory area principle of load flow from slab to supporting beam? **(6)**

   c) What is building configuration? Explain various configurations in building? **(6)**

Unit - II

2. Calculate wind load on rectangular clad building with mono slope roof with over hangs. Consider height (h) = 5.0 m, width (w) = 10m, length (l) = 20 m, roof angle $\alpha = 20°$ and overhang = 0.5 m, ground is flat, life of building 25 years, terrain category - 2, and building is constructed at surat. **(16)**

OR

2. Calculate wind load on walls and roof of a rectangular clad building having pitched roof and located in a farm house, height of building is 4.0m, width 12 m and length 20m. Roof angle 10°, opening in wall = 10%, over hangs on either side is 0.5m, Building is located in Hyderabad. **(16)**

Unit - III

3. Calculate earthquake load on a 6 storey R.C. framed building with live load of 4.0 KN/m² on floors. Building is having 2 bays in X direction and 3 bays in Y direction, storey height is 3.0m, all beams of 230 × 400mm and columns 375 × 500 mm sizes. Floor thickness 100mm and walls of 230mm. Building is situated in seismic zone V and constructed for communication centre and is resting on rocky ground. Configuration of building is of special moment resisting frame. **(16)**

OR

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

b) Calculate force in given frame building with following data. **(12)**

i) Column size = 375 × 375 mm

ii) Beams size = 300 × 375 mm

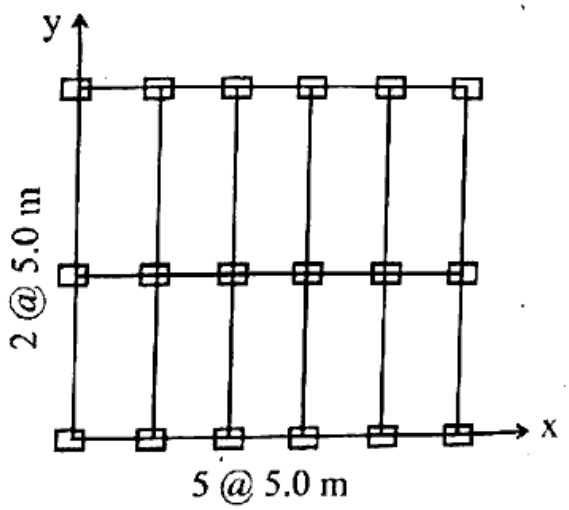
iii) Brick wall thickness = 150 mm

iv) Floor thickness = 120 mm

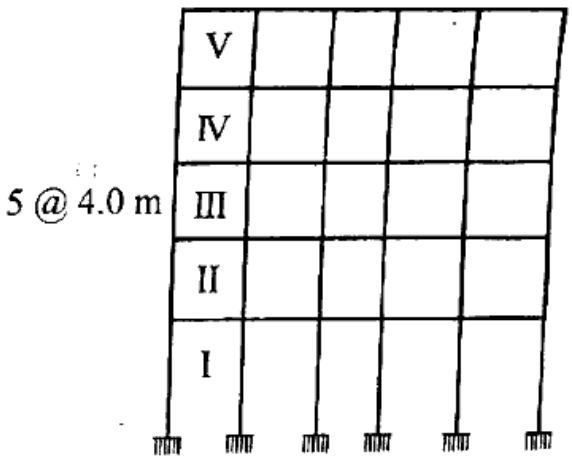
v) Live load on the floor = 4.0 kN/m²

vi) Storey height = 4.0 m each

vii) No of storeys = 5



Plan



Elevation

Unit - IV

4. a) Write short note on ductile detailing of beam, column and beam - column joint? **(8)**

b) What are the construction practices to ensure earthquake resistance for Masonry buildings. **(8)**

OR

4. a) How do you define wall and column in a masonry building? Explain effective length of masonry wall and column? **(6)**

   b) Calculate the height for a thickness of 300mm of a free standing masonry wall, subjected to wind load corresponding to 1.0 kN/m^2. Permitted tensile stress in masonry is 0.05 N/mm^2. **(10)**

Unit - V

5. a) Write a short note on mass housing and precast elements. **(6)**

   b) Calculate the stresses in shell of a cylindrical type using beam theory consider the radius of shell = 6.0 m, span = 20 m, semi central angle $\phi = 60°$, thickness t = 75 mm. **(10)**

OR

5. a) What are the difference between folded plate and cylindrical shell. **(6)**

   b) Write short notes on : **(10)**

   i) North light shell roofs

   ii) Grid and ribbed floors

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