

**5E5065**

Roll No. \_\_\_\_\_

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**5E5065**

**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  $\alpha = 20^\circ$  and overhang = 0.5 m, ground is flat, life of building 25 years, terrain category - 2, and building is constructed at surat. (16)

**OR**

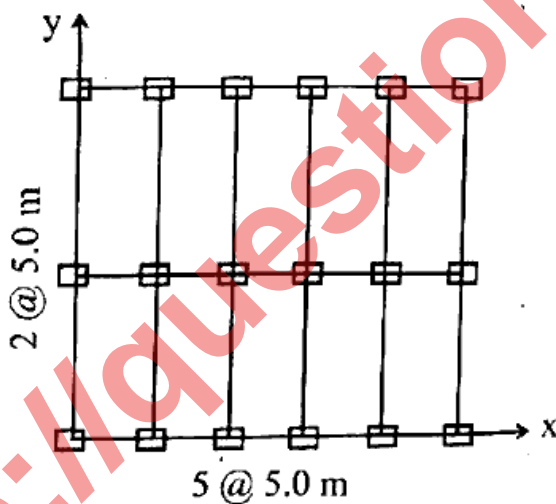
2. Calculate wind load on walls and roof of a rectangular clad building having pitched roof and located in a farm house, height of building is 4.0m, width 12 m and length 20m. Roof angle  $10^\circ$ , opening in wall = 10%, over hangs on either side is 0.5m, Building is located in Hyderabad. (16)

### Unit - III

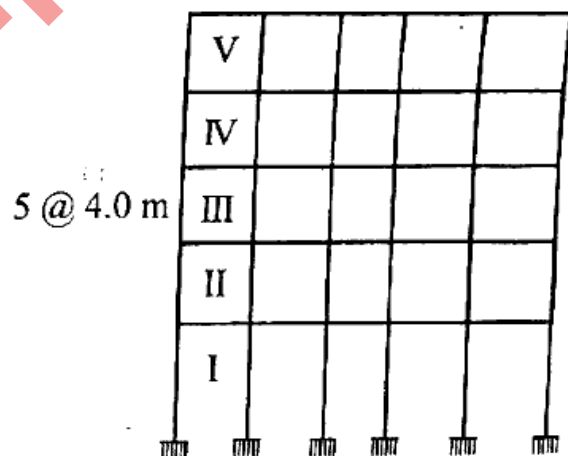
3. Calculate earthquake load on a 6 storey R.C. framed building with live load of  $4.0 \text{ kN/m}^2$  on floors. Building is having 2 bays in X direction and 3 bays in Y direction, storey height is  $3.0 \text{ m}$ , all beams of  $230 \times 400 \text{ mm}$  and columns  $375 \times 500 \text{ mm}$  sizes. Floor thickness  $100 \text{ mm}$  and walls of  $230 \text{ mm}$ . 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)
- Column size =  $375 \times 375 \text{ mm}$
  - Beams size =  $300 \times 375 \text{ mm}$
  - Brick wall thickness =  $150 \text{ mm}$
  - Floor thickness =  $120 \text{ mm}$
  - Live load on the floor =  $4.0 \text{ kN/m}^2$
  - Storey height =  $4.0 \text{ m}$  each
  - 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  $1.0 \text{ kN/m}^2$ . Permitted tensile stress in masonry is  $0.05 \text{ N/mm}^2$ . (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  $\phi = 60^\circ$ , thickness  $t = 75 \text{ mm}$ . (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

