

B.Tech. VII Semester (Back) Examination Dec. - 2015**Civil Engg.****7CE4 (O) Building Design****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****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 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 1, 2 and 3

2. Is 1893. Part - I

Unit - I

1. a) Explain The Terms "Strength" and 'Stiffness'. Explain the situations, Which cause sudden changes in Stiffness and Strength between different storeyes of a building with figure. (6)
b) Explain 'load flow' to different structural components with figure (3)
c) Explain typical cases of asymmetry in buildings with figures (3)
d) Explain 'Framed tube', 'trussed tube', tube - in - tube, and 'bundled tube' Systems with figures (4)

OR

1. a) Explain the role and behaviour of shear walls with figures (6)
b) Find the design loads for an interior column of
 - i) Ground floor
 - ii) 3rd Floorof a six storey building for the data :

height of each floor = 3.5m, Spacing of columns c/c in each direction = 3.8m; live load on roof = 1.5kN/m², live load on each floor = 3.0kN/m². Thickness of R.C. slab = 120mm, Dead weight of floor finish = 1kN/m², Weight of wall and beam = 10.8kN/m (10)

Unit - II

2. A power plant structure having maximum dimension more than 60m is proposed to be built on down hill side near chittargarh. The height of the hill is 250m with a slope of 1 in 4. If the location is 200m from the crest of the hill on downward slope, and its eve board is at a height of 8m, determine the design wind pressure (16)

OR

2. Determine the design wind pressure on the purlins of an industrial building near Jaipur, with class of building: General with Life of 50 Years.

Terrain : Category 2

Maximum dimension : 40m

Width of building : 15m

Height at eve level = 9m

Topography : θ less than 3° , Permeability : Medium span of truss = 20m, Pitch = 1/5, sheeting : Ac Sheets, spacing of purlin = 1.40m, Spacing of truss = 4.50m (16)

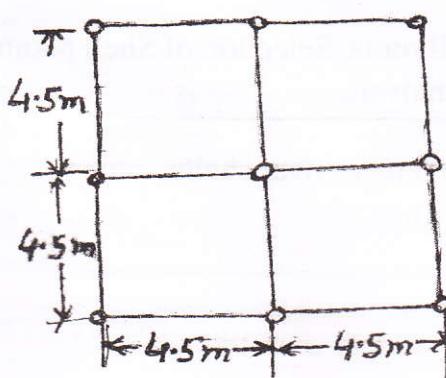
Unit - III

3. Determine the base shear forces in a two storey un-reinforced brick masonry building situated at surat; with building data as:

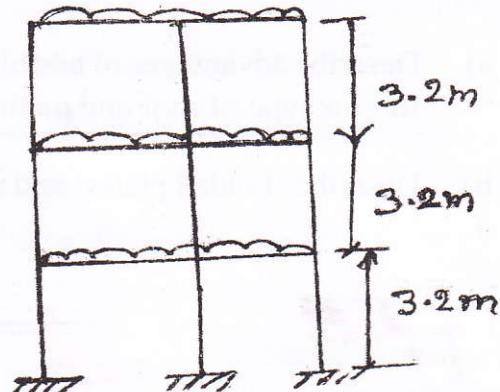
Plan Size = 25×25m, Total height of building 6.8m (each storey height = 3.4m) weight of roof = 2.5kN/m², Weight of Walls = 5.0kN/m² live load at roof = 1.0 kN/m², (25% of imposed load). Importance factor = 1.0, Response reduction factor = 1.5 Spectral Acceleration (Sa/g) = 2.5, Soil : Type II (Medium Soil) (16)

OR

3. The plan and elevation of a three - story RCC school building are shown below. The building is located in seismic Zone V. The type of soil encountered is medium stiff and it is proposed to design the building with a special moment resisting frame. The intensity of dead load is 10kN/m² and the floors are to cater to an imposed load of 3kN/m². Determine the design seismic loads on the structure by static analysis. (16)



(a) Plan



(b) Elevation

Unit - IV

4. Explain ductile detailing provisions as per IS 13920. For anchorages and splices of longitudinal reinforcement, Spacing and anchorage and splices of lateral reinforcement; with detailed explanation, and figures (16)

OR

4. a) Explain behaviour of unreinforced masonry walls, particularly under earthquake with figures (10)
- b) Explain behaviour of infill walls with figures (6)

Unit - V

5. a) Describe significance of prefabricated construction (4)
- b) Describe prefabricated systems for
- Foundation
 - Frames and Panels
 - Volumetric assemblies
 - Modularised building services (12)

OR

5. a) Describe advantages of northlight shell roots, Selection of Shell parameters for this type of roof and methods of analysis. (10)
- b) Describe 'Folded plates' and their advantages over shells. (6)
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