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7E4034

Roll No. : _____ Total Printed Pages : 4

# 7E4034

B. Tech. (Sem. VII) (Main/Back) Examination, December-2012

Civil Engg.

7CE4 Building Design

Time : 3 Hours] [Maximum Marks : 80

[Min. Passing Marks : 24

*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:1893 Part-I (2002) 2. IS:875 Part-3

## UNIT - I

1 (a) Explain various types of loads as per IS : 875. 8

(b) What are the various strengthening techniques adopted in buildings ? Explain it. 8

**OR**

1 (a) What is building configuration ? Explain various configurations in building. 8

(b) Describe the shear wall. What are the function of shear wal. 8

## UNIT - II

2 (a) Calculate the wind force of mono slope by given data :

(a) Height = 4.0 m
(b) Width = 8.0 m
(c) Length = 16.0 m
(d) Roof angle = 20°

(e) Over hang = 0.50 m
(f) Opening = Larger side open
(g) Around - Flat
(h) Life - 25 years, Wind 3 one - II, Terrain - 2, Class A.

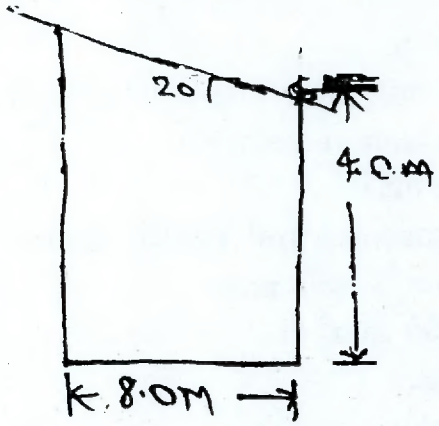


Fig. 1

(b) Write short note on general theory of wind of structures. 12+4

**OR**

2 Calculate wind pressure and design force on walls and roof of a rectangular clad building with pitched roof, having plan dimensions 10 m × 50 m and height 5 m, as shown in fig. The building is situated of Jaipur in an industrial area 500 m inside open land on a fairly level topography walls of building have 20 openings of 1.3 m × 1.3 m size. The roof is of G.C. sheeting and the roof angle is 15°. Calculate also the local wind pressure on roof and wall cladding ?

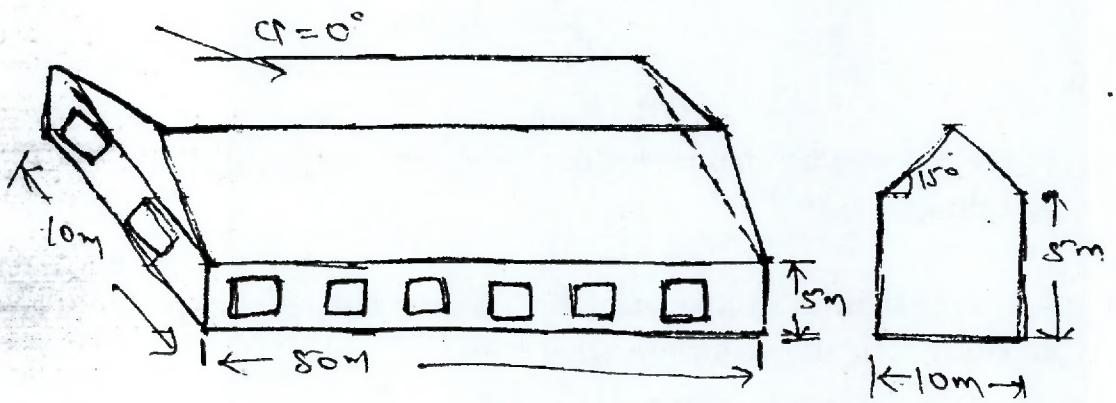


Fig. 2

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## UNIT - III

3 Determine the design base shear for the plane frame of a four storeyed, symmetric R.C. building. The building is situated in Delhi ?

(a) Floor height - 3.5 m

(b) In fill walls = 250 mm tuck longitudinal walls and 150 mm (Brick) thick transverse walls

(c) Line load = 3.5 kN/m$^2$

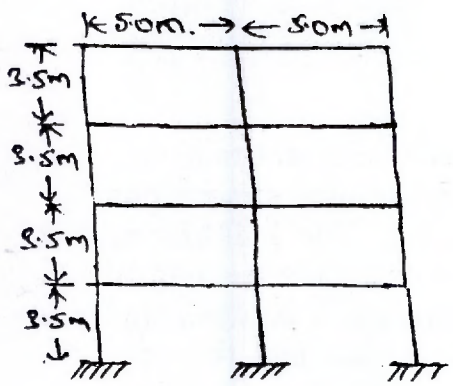
(d) Materials = $M_{20}$ concrete and Fe415 steel

(e) Columns = 250 mm × 450 mm

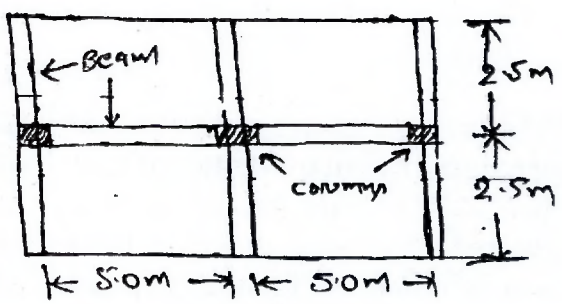
(f) Beams = 250 × 400 mm

(g) Slab = 100 mm thick

(h) Type of soil = Rocky.




(a) Plane frame




(b) Plan showing the columns and beams at floor levels of the plane frame

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**OR**

3 (a) Write the step by step procedure for seismic analysis of R.C. Buildings.

6

(b) A three storeyed symmetrical R.C. school building situated at Bhuj with the following data :

(1) Plan dimensions = 7 m

(2) Storey height = 3.5 m

(3) Total weight of beam in a storey = 130 kN

(4) Total weight of slab in a storey = 250 kN

(5) Total weight of column in a storey = 50 kN

(6) Total weight of walls in a storey = 530 kN

Line load = 130 kN

weight of terrace floor = 655 kN

The structure is resting on hard rock. Determine the total base shear and lateral loads at each floor levels for 5% of damping using seismic coefficient method ?

**10**

## UNIT - IV

4 Write short note on :
(a) Retrofitting in masonary building
(b) Masonary in fill wall
(c) Ductile detailing
(d) Provisions of Indian seismic codes.

**4×4**

**OR**

4 Explain ductile detailing of columns and frame members with axial load (P) and moment (M) requirements.

**16**

## UNIT - V

5 (a) Write the advantages and disadvantages of :
(i) Pre fabrication
(ii) Shell Roofs.

8

(b) Explain the approximate analysis of grid floors.

8

**OR**

5 Write short note on :
(a) North light shell roofs
(b) Folded plate roofs
(c) Rankine Grash off method
(d) Panel housing concept.

**4×4**

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