Any missing data may be reasonably assumed

Answer the following questions

Question (1)

a) Sketch two different structural systems for a tall building construction showing how it can resist horizontal loads.

b) In the analysis of coupled shear walls, show how to use the continuous medium method

Question (2)

The frame shown in fig(1), is the main supporting element in a multistoried governmental construction. It consists of 26- stories with a total height 80m. Spandrel beams and columns are with constant constant cross section bxt= 40.0cm x 100.0cm and the spacing between frames is 5.0m center line to center line. Based on the Egyptian Code of practice find the following;

1- The static horizontal load equivalent to wind load effect (the construction is located in a costal area)

2- Drift of the frame at the roof level.

3-The bending moment diagram at the floor level number 15.

Question (3)

The plan shown in fig(2) is a typical of a multistoried construction with 20 stories height. At the base level the construction resisting horizontal wind force of 240 tons lies on the direction shown below.

Based on the above find the distribution of the horizontal force among the different shear walls.

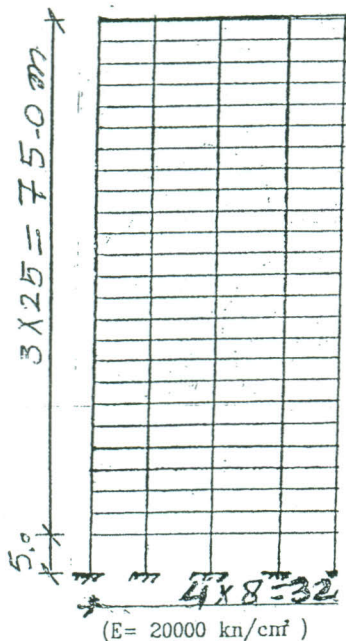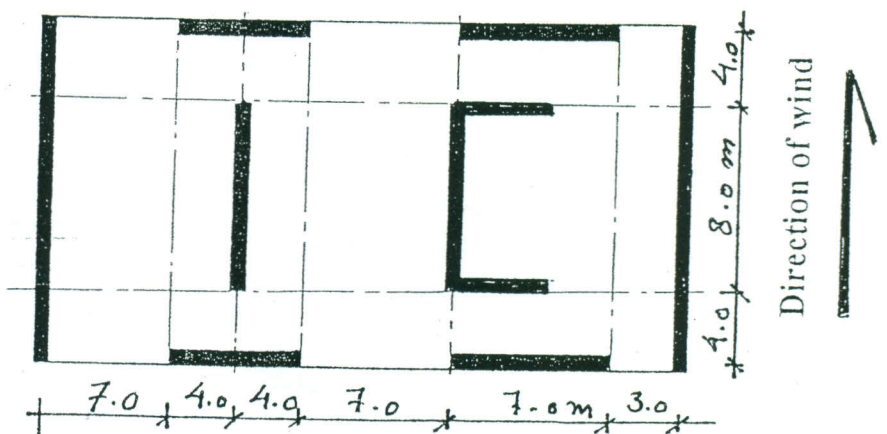(Note: all walls are with 30cm thick and the story height 3.0m)

$3 \times 25 = 75.0$ m

$4 \times 8 = 32$

(E= 20000 kn/cm^2)

Figure (1)

7.0   4.0, 4.0   7.0   7.0 m   3.0

4.0   8.0 m   4.0

Direction of wind

Figure (2)