Kaferelshiekh University	Faculty of Engineering	Department of Civil Engineering	
Second Year Students of Civil Engineering	Course title: Design of Reinforced Concrete structures I		Course code : CES3015
Date : 13-6-2021	Term : Second	Total Assessment Marks : 75	Time Allowed : 4 hours
f_{cu} = 30 MPa, St.360/520, L.L.= 2 kN/m² Flooring cover = 2 kN/m² for all questions		Any missing data should be reasonably assumed. Answer as many questions as you can.	

LOS (A4, A3, A1, B1, B2, B4)

The following figure showed a structural plan of a building consisted of ground plus 5 floor. If red brick walls exist over all beams and its weight = 8 kN/m³, beams had cross-section 250x600 mm, the column C1 is 250x600 mm, C2 is 250x800 mm, C3 is 250x900 mm, shear wall (SW) is 250x? mm. Ground floor height = 5 m and typical floor height = 3 m. The building rested on a raft have 100 cm thickness. It is required to carry out the following: -
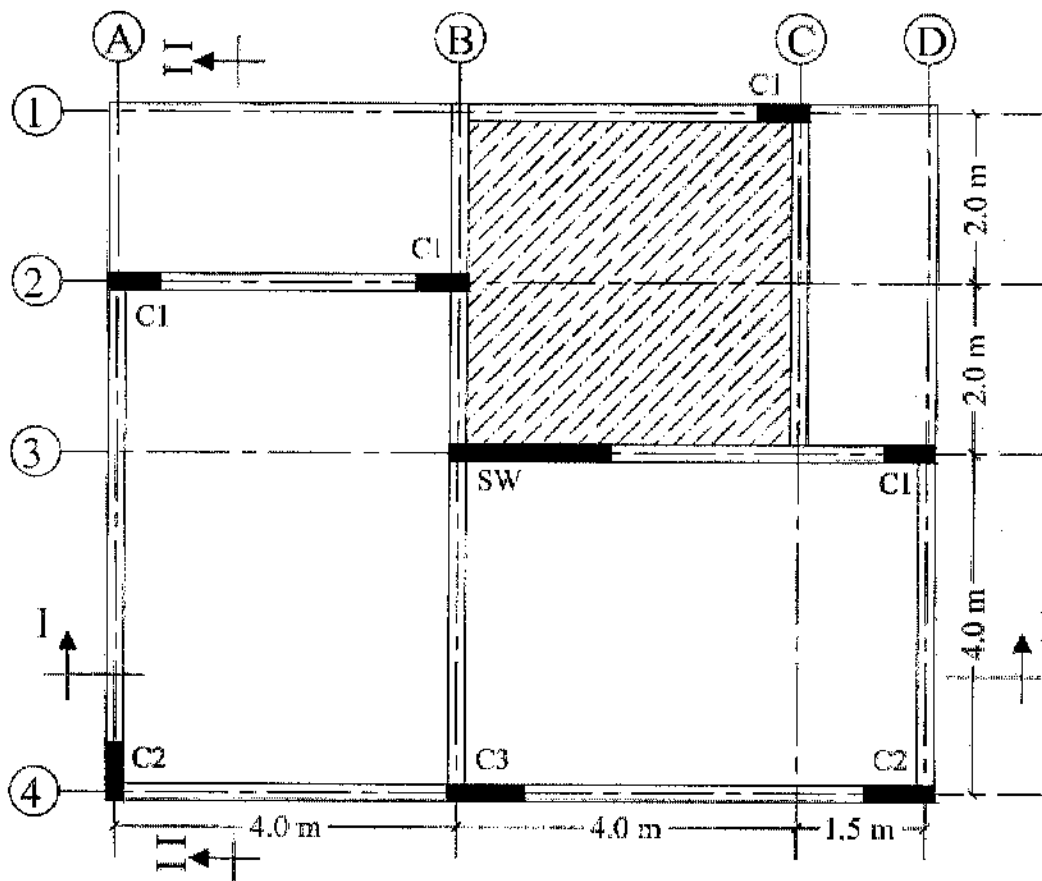
(1) Draw reinforcement details with suitable scale for the beam placed at axis (B). [12 mark]

(2) Estimate deflection values at the critical section and check with respect to Egyptian code for the beam placed at axis(1).Consider cross-section is rectangular with 4Ø16 bottom RFT and 2Ø12 top RFT. [12 mark]

(3) Design and draw RFT details (with scale 1:50) of slab strips I, II. Without calculations, draw RFT details of all slabs (with scale 1:50). [12 mark]

(4) Check bracing condition in y-direction. Consider slab thickness = 150 mm for all slabs and columns weight 10 % of the total weight. Calculate the unknown dimension of SW to achieve that the building is braced in x-direction. [12 mark]

(5) Calculate the straining actions and design (design + drawing with scale) for the columns placed at intersection axis **A with 2 at ground floor level** and at intersection axis **B with 2 at second floor level** and intersection axis **B with 4 at final floor level**. Consider slab thickness = 150 mm for all slabs and width of all columns 250 mm then find the dimensions. [15 mark]

(6) Design a circular column that loaded by the straining actions: -
P_u = 400 kN. M_{ux} = 150 kN.m M_{uy} = 140 kN.m Diameter = 700 mm. [12 mark]

With best wishes Dr. Sabry El-Morsy