

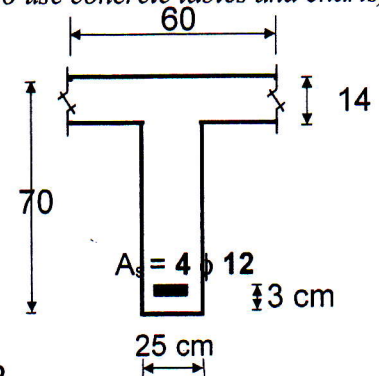


Answer all the following questions:

(Permitted to use concrete tables and charts)

Question 1 : (10 Marks)

For the given reinforced concrete T-section:
 $f_{cu} = 25 \text{ N/mm}^2$ & Steel grade 360/520
 by using the first principals find:
 M_{cr} (Cracking moment).



Question 2: (50 marks)

For the given 5-floor building:
 $f_{cu} = 350 \text{ kg/cm}^2$ & Available Steel grades 24/35 & 36/52
 Fl. cover = 150 kg/m² & Live load = 250 kg/m² & Soil bearing capacity $\sigma_{soil} = 1.5 \text{ kg/cm}^2$
 It's required to make complete design* for the given members:

1. Cantilever Slab S_1 and slab S_2 as solid slabs. (25 marks)
2. Beams B_1, B_2, B_3 then, check their shear strength. (25 marks)

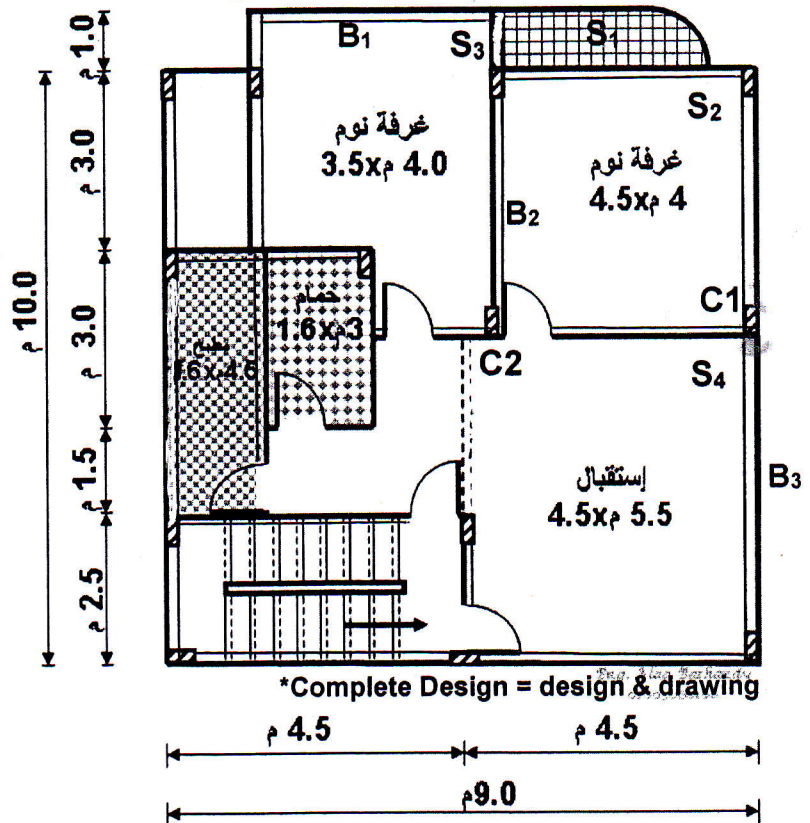
Question 3: (15 marks)

For the short braced axially loaded column C_1 (at the previous given plan) it is required to:

1. Calculate the loads for C_1 considering 3-floor building.
2. Make a complete design* for C_1 considering its ultimate load $P_u = 140 \text{ t}$.

Question 4: (10 marks)

Make a complete design* for the isolated footing of column C_2 (at the previous given plan) if you know that: $P_u = 160 \text{ t}$, Col. Dim. 25x60cm and Steel grade 36/52.



*Complete Design = design & drawing

Question 5: (5 marks)

Suggest three different structural systems for the stair (at the previous given plan) showing their loading system. (use sketches)

With my best wishes. Dr. ALaa A. Bashandy

This exam measures the following ILOs

Question Number	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Skills		a1, a2, a3, a4, a5	a1, a2, a3, a4, a5	a1, a2, a3, a4, a5		b1, b2, b3, b4	b1, b2, b3, b4	b1, b2, b3, b4			d1, d2, d3, d4	d1, d2, d3, d4	d1, d2, d3, d4		
	Knowledge & Understanding Skills					Intellectual Skills					Professional Skills				