٢ مدني
١٤/٦/١٠
فرسانه صلاح

Menoufeya University
College of Engineering
Civil Engineering Dept.
Total Marks 120

Reinforced Concrete
2nd Year Civil
Time Allowed 4 hrs
June, 1st 2014

N. B. Any needed data not given is to be reasonably assumed

Question (1) (10)

A cantilever beam 25x60 cm2 is subjected to a concentrated load at its end and is reinforced with 5Φ16. Calculate the maximum load that the beam can resist without cracking, considering the beam weight. f_{cu}=25 N/mm^2, fy = 360 N/mm^2.

Question (2) (40 %)

For the reinforced concrete floor shown in figure: Live load=2.5 kN/m2, floor covering=1.5 kN/m2, f_{cu}=25 N/mm^2, fy = 360 N/mm^2,

a- Design the slab S1 as solid slab.
b-Design the slab S2 as two-way hollow block slab.
c- Design the continuous beam B1.
d- Design the girder B2.

Question (3) (20 %)

a- Design a spiral R.C. column to resist an axial ultimate load of 1750 kN, f_{cu}=30 N/mm^2, fy = 400 N/mm^2, fy (spiral) = 240 N/mm^2.
b- A reinforced concrete rectangular un-braced column 6.0 m high is partly fixed at both ends and is subjected to an axial load of 1400 kN and a bending moment of 220 kN.m.(ultimate load).
Use the interaction diagram to design the column.
f_{cu}=25 N/mm^2, fy = 360 N/mm^2.

Question (4) (25 %)

It is required to design an isolated R.C. footing to carry a 30x50 column of 1600 kN ultimate load. Assume the reinforced concrete base is 70 cm depth. The soil bearing capacity is 125 kN/m2, fcu = 25 N/mm2, fy = 360 N/mm2.
Draw all necessary details.

Question (5) (25%)

Draw the statical system for the floor shown in figure, Showing :Slabs, Beams, and columns. Columns are allowed on axes only.

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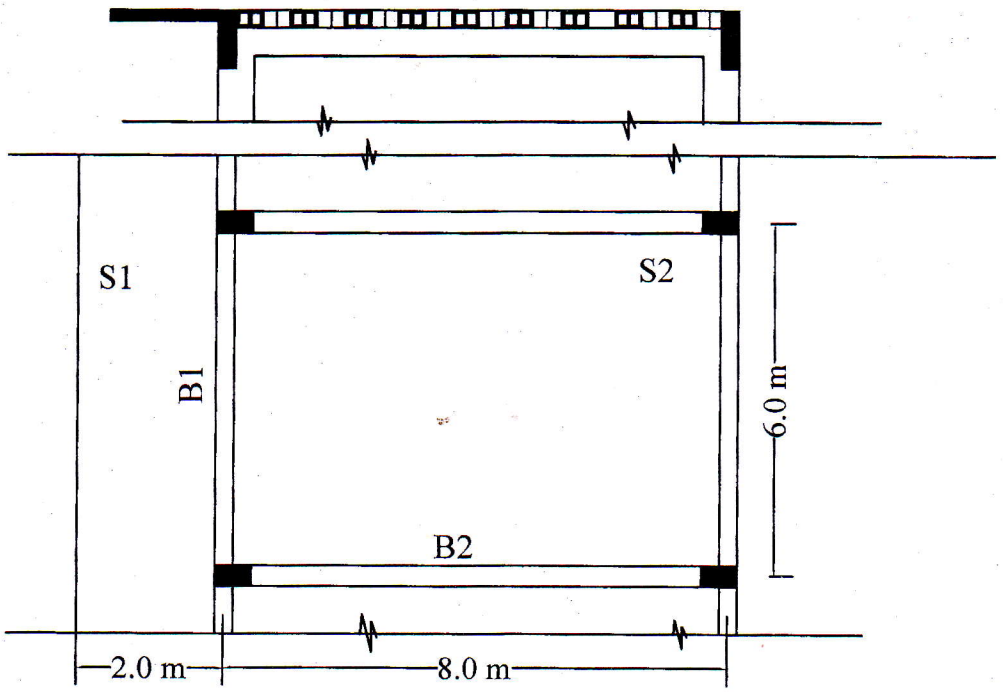
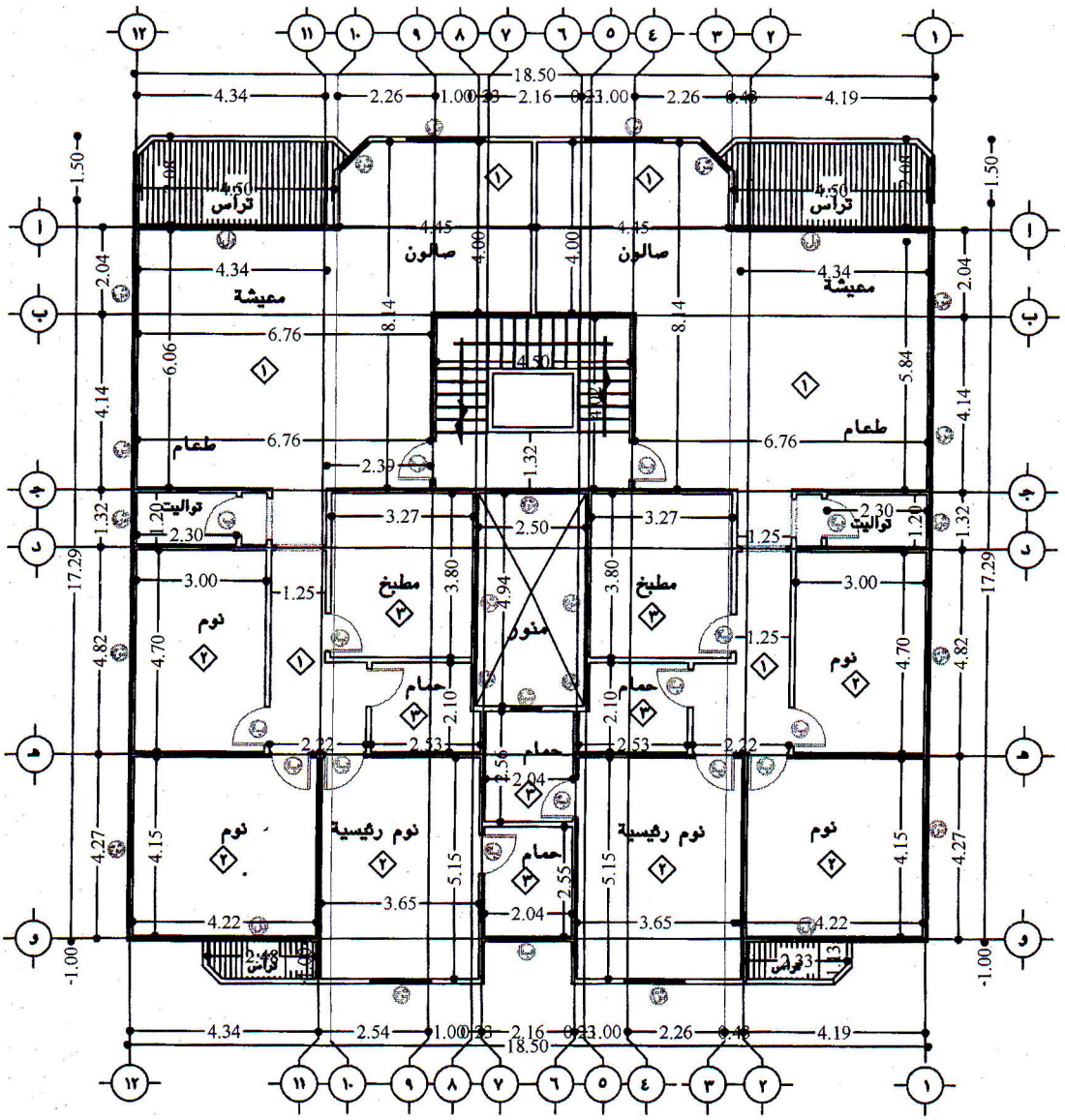
Design = calculation + drawing of details.



Problem (1)



Problem (5)