Fayoum university
Faculty of Engineering
Arch.Eng.Departement year 2

First term exam
17/1/2016
Time: 3 hours

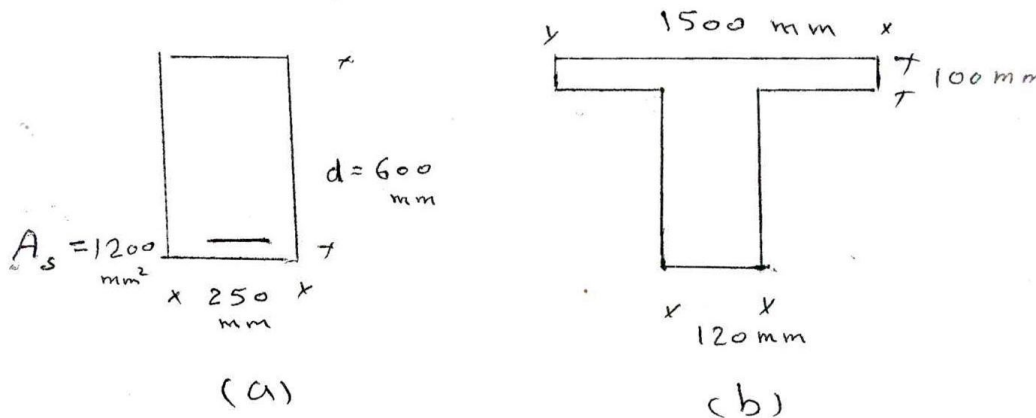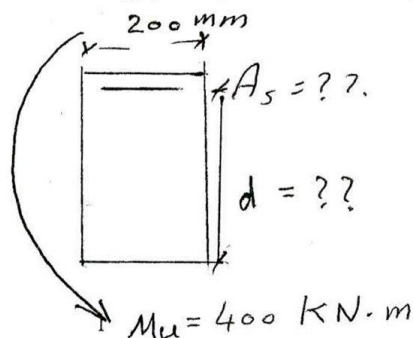
Reinforced Concrete

Question no.1 : (Figure 1)

a) for the shown cross-section determine the bending moment that can be carried by this cross section if : As=1200 mm^2 , Fcu=25N/mm^2 , Fy=400N/mm^2

b) the figure shows a T-section that is subjected to an ultimate moment of a value of 220 KN.M . calculate the required depth and area of steel . knowing that Fcu=25N/mm^2, Fy=360N/mm^2


(a)   (b)

Question no.2 :

A reinforced concrete cross-section is subjected to a bending moment of a factored value of 400KN.m . the beam has a width of 200 mm . it is required to design the cross-section using (R1-w) curve . knowing that Fcu= 30N/mm^2 , Fy=280N/mm^2

Quetion no.3 : (Figure 2)

A reinforced concrete floor is constructed as shown in figure 2 . a beam with a cross section of (250mm*600mm) is provided on all column lines the floor is designed to carry a life load of $3KN/m^2$ and a flooring material of $2KN/m^2$. knowing that $Fcu=25N/mm^2$, $Fy=360N/mm^2$

a) calculate and draw the reinforcement required for the floor

b) calculate the straining action M , Q on the beam (B1) , design cross-section to calculate As , draw a reinforcement details (full details)

c) calculate column dimension and reinforcement for column (C1) if it is a short column and braced
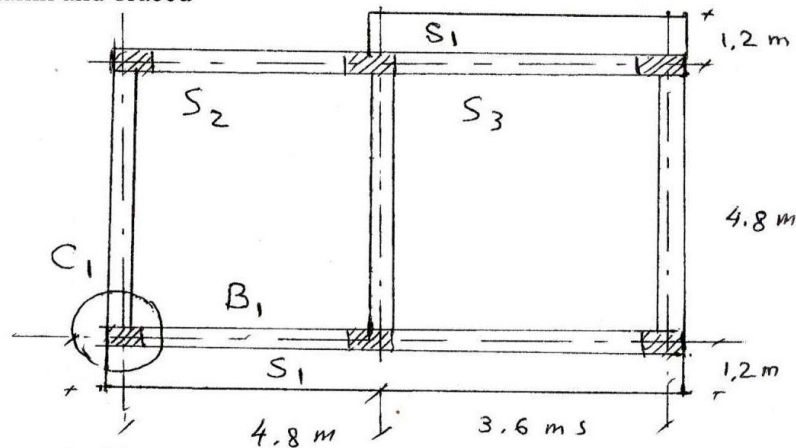
Question no.4 : (Figure 3)

Design the staircase shown in figure 3 below as slab-type . the life load is $40KN/m^2$, the $Fcu=30N/mm^2$, $Fy=280N/mm^2$. the weight of the covering material is $0.75KN/m^2$ for the stairs and $1.8KN/m^2$ for landing, floor height $=3.3m$ and $\gamma_w =12KN/m^3$

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