**Problem I (50 Pts.):**
A spherical compact load, with a diameter of 20 cm, is located 15 cm in front of the worker. This load is supposed to be lifted by the worker to the knuckle height (about 75 cm height), with a frequency of once per 5 minutes (i.e. f=1/5). Fmax was read from the table as equal to 15 (i.e. Fmax=15).

a) If the weight lifted is 30 kg. Do you see any risks in this lifting task? Explain and show all details of your work.
Hint: AL=40 [(15/H)(1-(0.004 |V-75|))(0.7+7.5/D)(1-F/Fmax)].

b) Assume that the weight of the object cannot be changed, what recommendations would you make so the task will be more comfortable?

Problem II (50 Pts.): A man (W=80 kg) grips a hand drill (m=5 kg) parallel to the ground, as shown in the diagram below. If the extensor carpi radialis (ECR), that is, the wrist muscle, counteracts the weight of the drill in order to hold it parallel to the ground.

$\Delta x = 2$ cm $L_2 = 30$ cm
$L_1 = 12$ cm $L_3 = 6$ cm
(a)
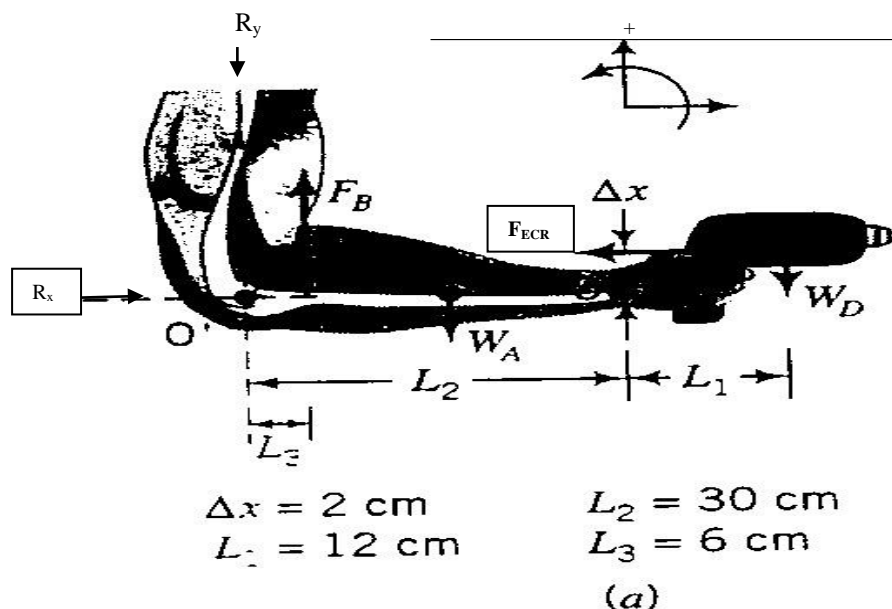
Hint: W_A=0.05 W, W_D= 5 kg, L_1= 12 cm, L_2= 30 cm, L_3= 6 cm, Δx= 2 cm.

1)- Write the equilibrium conditions by using the information available in the diagram above?

2)- What is the force muscle (F_{ECR})?

3)- Compute the vertical force of the biceps muscle (F_B) as well as (R_x) and the vertical reaction force (R_y) at the elbow joint in order to hold the forearm parallel to the ground?