Olabisi onabanjo university (oou)

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## **EES/18/19/0301**

## **Civil engineering**

## **Meg 206**

## **Assignment**

A 75kg man stands on a spring scale in an elevator. During the first 3 seconds of motion from rest, the tension T in the hoisting cable is 8300 N. Find the reading R of the scale in newton during this interval and the upward velocity u of the elevator at the end of the 3 seconds. The total mass of the elevator, man, and scale is 750kg.

Solution

The force measure by the scale and the velocity they both depend on the acceleration of the elevator, which is constant during the internal on which the forces are constant.

Parameters: mass of the man=75kg

t1=3secs

T=8300N

R=?

V=?

Mass of the elevator + man + scales= 750kg

8300-7360 = 750a

a = 1.257m/s^2

The scale reads downward force exerted on it by the man‘s feet. The equal and opposite reaction R to this action is shown on the free body diagram of the man alone together with his weight and the equation of motion for him gives

R 3– 736 =75(1.257)

R – 736 =94.275

R = 94.275 + 736

R =830.275 N The velocity reached at the end of secs

Change in velocity

∆v =



a dt



V – 0 = 3

1.257dt.



. 0

V = 3.77m/s