

**KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS**  
**DEPARTMENT OF PHYSICS**

**PYP – 001-11**

**I.D. #**

**Name: Key**

**QUIZ No. 2**

1- Find the acceleration of the 2 Kg cart moving horizontally when the three identical masses are attached to the second end of a string (the mass for each one is 1 kg), see the figure.

**Answer:**

The horizontal cart:

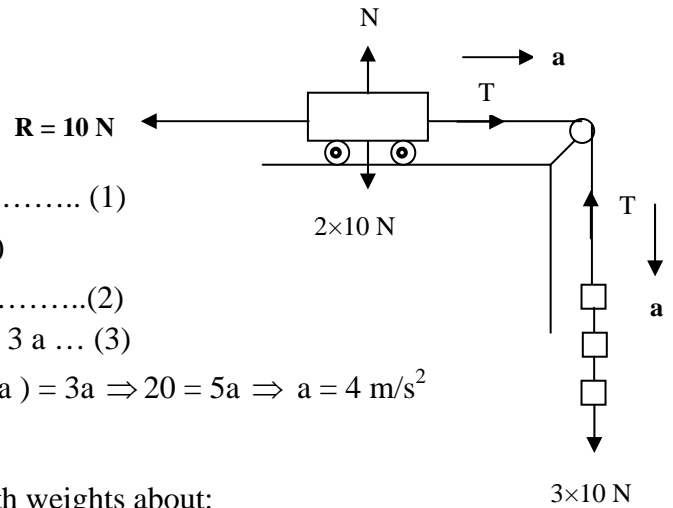
Horizontally:  $\sum F = ma \Rightarrow T - R = ma \Rightarrow T - 10 = 2a \dots\dots\dots (1)$

Vertically (No motion):  $\sum F = ma \Rightarrow \sum F = 0 \Rightarrow T - 2 \times 10 = 0$

$T = 20 \text{ N} \dots\dots\dots(2)$

The vertical masses:  $\sum F = ma \Rightarrow 3 \times 10 - T = ma \Rightarrow 30 - T = 3a \dots (3)$

Solve the equation (1) and (3) for (a), you can find:  $30 - (10 - 2a) = 3a \Rightarrow 20 = 5a \Rightarrow a = 4 \text{ m/s}^2$



2- A 2 kg mass at 150 m height from the surface of the Earth weights about:

- a- 18.4 N
- b- 300 N
- c- 200 N
- d- 600 N
- e- 2 N