

Answer on Question 51950, Physics, Other

Question:

A 65kg sprinter completes a 100m race in 9.83s . Calculate the average kinetic energy of the sprinter:

- a) 3.36kJ
- b) 2.11kJ
- c) 34.15kJ
- d) 65.42kJ

Solution:

Let's first determine the average velocity of the sprinter:

$$v_{avg} = \frac{s}{t} = \frac{100\text{m}}{9.83\text{s}} = 10.17 \frac{\text{m}}{\text{s}}.$$

Then, the average kinetic energy of the sprinter is:

$$KE_{avg} = \frac{1}{2}mv_{avg}^2 = \frac{1}{2} \cdot 65\text{kg} \cdot \left(10.17 \frac{\text{m}}{\text{s}}\right)^2 = 3.36 \cdot 10^3\text{J} = 3.36\text{kJ}.$$

Answer:

- a) 3.36kJ .

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