H.W.1

Q1. Calculate the kinetic energy of an object of mass 2kg moving with a speed of 9m/s?

$$KE = \frac{1}{2}mv^2 = \frac{1}{2}(2)(9)^2 = 81 \text{ J}$$

Q2. What is the speed of an object of 1kg mass with a kinetic energy of 50J?

$$m = 1 \text{ kg} \qquad KE = 50 \text{ J} \qquad V = ??$$

$$kE = \frac{1}{2}mv^2 \qquad\qquad V = \sqrt{\frac{2KE}{m}}$$

$$V = \sqrt{\frac{2 \times 50}{1}} = 10 \text{ m/s}$$

Q3. An object moving with a speed of 67 m/s and has a kinetic energy of 500 J, what is the mass of the object?

$$V = 67 \text{ m/s} \qquad KE = 500 \text{ J} \qquad m = ??$$

$$KE = \frac{1}{2}mv^2 \qquad\qquad m = \frac{2KE}{v^2}$$

$$m = \frac{2 \times 500}{67^2} = 0.223 \text{ kg}$$

Q4) Which of the following types of energy relies on the square of the body's speed and mass?
A) Potential
B) Kinetic
C) Nuclear
D) Electrostatic

λ

E

Q5) Calculate the wavelength and energy of light that has a frequency of 1.5 x 10^15 Hz?

$$f = 1.5 \times 10^{15} Hz \qquad\qquad C = 3 \times 10^{8} m/s$$

$$\lambda = \frac{C}{f} = \frac{3 \times 10^{8}}{1.5 \times 10^{15}} = 0.000\ 0002m$$
$$200\ nm$$

$$E = hf = 6.626 \times 10^{-34} \times 1.5 \times 10^{15}$$
$$= 9.939 \times 10^{-19} J$$

Q6) Calculate the frequency of light that has a wavelength of 4.25 x 10^-9 m?

λ

$$f = \frac{C}{\lambda}$$

$$= \frac{3 \times 10^{8}}{4.25 \times 10^{-9}} = 7.06 \times 10^{16} Hz$$