

Calculate the following:

- (i) the kinetic energy of a body which has a mass of 5 kg and a velocity of 10m/s;
- (ii) the change in potential energy of a mass of 5 kg when it is raised a height of 3m;
- (iii) the increase in internal energy of a gas in a closed system during a process in which - 100 J of heat transfer and 400 J of work transfer take place.

Kinetic energy

$$E_c = \frac{1}{2}mv^2 = \frac{1}{2} \times 5 \times 10^2 = 250 \text{ J}$$

Change in potential energy

$$\Delta E_p = mgz = 5 \times 9.18 \times 3 = 147 \text{ J}$$

Increase in internal energy

$$W + Q = U_2 - U_1 = 400 - 100 = 300 \text{ J}$$