

Phys11 Energy : Test - 60

1) Fill in the blanks.

a) The energy of a system increases when _____ is done on the system.

b) The energy of motion is called the _____ energy.

c) As an object falls, it loses _____ energy and gains _____ energy.

d) The _____ energy is equal to the sum of the kinetic and potential energies.

e) The work done by a machine per unit time equals the _____.

f) If the velocity of a body triples, its kinetic energy is multiplied by a factor of _____ .

g) The law of "Conservation of Energy", states that :
_____.

2)a) A load of 86 kg is lifted 7.0 m. find the work done. _____

b) Find the increase in potential energy. _____

3) If a baseball with a mass of 0.45 kg is thrown with a velocity of 22 m/s, find the initial kinetic energy. _____ .

4) If a 0.55 kg baseball is thrown vertically with an energy of 85 J, find the maximum height the ball reaches. _____

5) A box is pulled horizontally by a force of 150 N at a constant speed over a distance of 8.5 m. The work done on the box is _____ . The work done against friction is _____ .

6) A man pushes an 85 kg box horizontally over a distance of 4.7 m, using a force of 250 N. The friction force is -75 N. The work done by the man is _____ . The work done against friction is _____ .

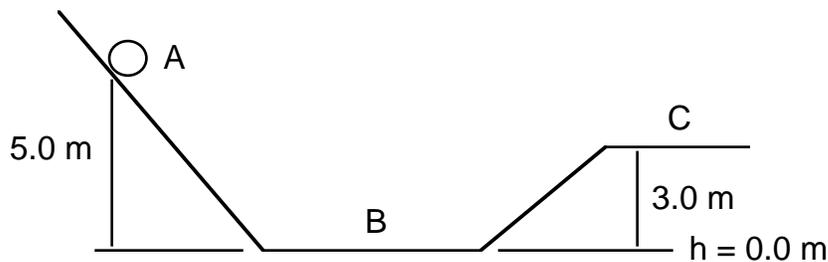
The increase in kinetic energy is _____. The final speed of the box is _____.

7) Suppose that you lift a 35 kg crate vertically 1.5 m, then carry it horizontally 2.5 m and put it on a shelf (1.5 m high). Find the total work done. _____.

8) A 530 kg wrecking ball has a maximum potential energy of 120,000 J. Find the maximum speed of the ball. _____

9) A pendulum has a speed of 1.8 m/s at its lowest point. The maximum height that it rises to is _____.

10) A ball rolls down the incline (A) and up to the other side (C). The initial speed is zero. Find the speed at B. _____ and C _____.



11) The output of a machine is 180 W. The input is 200. W. The efficiency is _____.

12) A motor has a power rating of 370 W. How much time will it take to raise a 45 kg mass to a height of 18 m ? _____.

13) A machine requires an input power of 72 watts. It does 3500 J of work in one minute. Find the efficiency. _____.

14) How much energy does it require to heat 240 L of water from a temperature of 18°C to a temperature of 67°C ? ($C_w = 4200 \text{ J/kg/}^\circ\text{C}$) _____.

15) If 2.0 L of water at 25°C is added to 3.0 L of water at 45°C, find the new temperature in degrees Celsius. _____.

16) A 1.8 kg iron ingot is dropped into 0.75 L of 22°C water, the temperature of the water rises to 85°C. Find the original Celsius temperature of the ingot. ($c_{\text{iron}} = 450 \text{ J/kg/}^\circ\text{C}$) _____ .

Answers : 1)a) work, b) kinetic, c) potential, kinetic, d) total, e) power, f) nine, g) The total energy remains constant for an isolated system.,
2)a) 5900 J, b) 5900 J, 3) 110 J, 4) 16 m, 5) 0.0 J, 1300 J, 6) 1200 J, 350 J, 850 J, 4.5 m/s, 7) 510 J, 8) 21 m/s, 9) 0.17 m, 10) 9.9 m/s, 6.3 m/s, 11) 90.%, 12) 21 s, 13) 81%, 14) $4.9 \times 10^7 \text{ J}$, 15) 37, 16) 330.