St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 1st

Work Sheet – 22

Class – XI | Subject – Physics | Date – 10.07.20

Chapter – Work, Power & Energy | Topic – Conservative and non-conservative system

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Choose the correct option for the following questions. $1 \times 15 = 15$

1. According to work-energy theorem , change in kinetic energy is equal to work done by –
   a. Conservative force
   b. Non- Conservative force
   c. External Conservative force
   d. All of above
2. Work energy theorem is applicable for –
   a. Only gravitational force
   b. Only frictional force
   c. Any central force
   d. All of the above
3. The work done by a conservative force is –
   a. Path dependent
   b. Path independent
   c. Zero
   d. None of these
4. The work done by a non conservative force over a close path is –
   a. Positive always
   b. Negative always
   c. Zero
   d. Can be +ve or –ve , but can never be zero
5. The work done by a non conservative force over a close path is –
   a. Positive always
   b. Negative always
   c. Zero always
   d. Can be +ve or –ve , but can never be zero
6. A person pulls a bucket of water from a well of depth h. If the mass of the uniform rope is m and that of the bucket full of water is M, then the work done by the person is –
   a. $\left(m + \frac{M}{2}\right) gh$
   b. $\frac{1}{2}(m + M)gh$
   c. $(m + M)gh$
   d. $\left(\frac{m}{2} + M\right) gh$
7. A projectile is fired from the origin with a velocity v at an angle θ with x axis. The speedof the projectile at an altitude h is –
   a. $v \cos\theta$
   b. $\sqrt{v^2 - 2gh}$
   c. $\sqrt{v^2 \sin^2\theta - 2gh}$
   d. None of these

8. A particle of mass m moves from rest under the action of a constant force F which acts for two seconds. The maximum power attained is –
   a. 2Fm
   b. F^2/m
   c. 2F/m
   d. $2F^2/m$
9. A block of mass 5kg is raised from the bottom of a lake to a height of 3m with out any change in kinetic energy. if the density of the block is $3000kg/m^3$, then the work done is equal to –
   a. 100J
   b. 150J
   c. 50J
   d. 75J
10. A force $\vec{F} = 3t\hat{\imath} + 5\hat{\jmath}$ N acts on a body due to which its displacement varies as $\vec{S} = 2t^2\hat{\imath} - 5\hat{\jmath}$ m. work done by this force in 2sec is –
    a. 32J
    b. 24J
    c. 46J
    d. 20J
11. An open knife of mass m is dropped from a height h on a wooden floor. If the blade penetrates up to the depth d into the wood, the average resistance offered by the wood is –
    a. $mg\left(1+\frac{h}{d}\right)$
    b. $mg\left(1+\frac{h}{d}\right)^2$
    c. $mg\left(1-\frac{h}{d}\right)$
    d. $mg\left(1+\frac{d}{h}\right)$
12. A bullet moving with speed 100m/s can just penetrate into two planks of equal thickness. Then the number of such planks it can penetrate if the speed doubled is –
    a. 6
    b. 10
    c. 4
    d. 8
13. A ball is dropped onto a floor from height of 10m. if 20% of its initial energy is lost, then the height of bounce is –
    a. 2m
    b. 4m
    c. 8m
    d. 6.4m
14. A spring of spring constant $5 \times 10^3 N/m$ is stretched initially by 5cm from the unstitched position. The work required to further stretch the spring by another 5cm is –
    a. 6.25 N-m
    b. 12.50 N-m
    c. 18.75 N-m
    d. 25 N-m
15. A pump is required to lift 800kg of water per minute from a 10m deep well and eject it with speed of 20m/s. the required power in watt is –
    a. 6000
    b. 4000
    c. 5000
    d. 8000