INTERNATIONAL INDIAN SCHOOL, RIYADH

WORKSHEET - 6

CHAPTER-6 WORK, ENERGY AND POWER

GRADE: XI **SUBJECT: PHYSICS**

1. If stretch in a spring of force constant k is doubled, calculate
   a) Ratio of final to initial force in the spring.
   b) Ratio of elastic energies stored in the two cases.
   c) Work done in changing to the state of double stretch.
2. A man weighing 55kg supports a body of 20kg on his head. Calculate work done by him if he moves a distance of 20m (a) on a horizontal road (b) upon a smooth incline of 1 in 5.(take $g=10m/s^2$)
3. A 16kg block moving on a frictionless horizontal surface with a velocity of 4m/s compresses an ideal spring and comes to rest. If the force constant of spring be 100N/m, then how much is the spring compressed?
4. A body of mass m falls from a height h and collides with another body of same mass at rest. After collision, the two bodies combine and move through distance d till they come to rest. Find the work done against the resistive force.
5. A 10kg ball and a 20kg ball approach each other with velocities 20m/s and 10m/s respectively. What are their velocities after collision, if the collision is perfectly elastic?
6. A body is constrained to move along the z-axis of a coordinate system is subject to a constant force $\mathbf{F}= (\mathbf{i}+2\mathbf{j}+3\mathbf{k})$ N. What is the work done by this force in moving the body over a distance of 4m along the z-axis?
7. What is an elastic collision? What will happen, when
   (a) A heavy body collides with a light mass at rest.
   (b) A light body collides with a heavy mass at rest.
8. A rain drop of radius 2mm falls from a height of 500m above the ground. It falls with decreasing acceleration due to viscous resistance of air until half its original height. It attains its maximum (terminal) speed, and moves with uniform speed thereafter. What is the work done by the gravitational force on the drop in the first half and second half of its journey? Take density of water $10^3 kg/m^3$.What is the work done by the resistive force in the entire journey if its speed on reaching the ground is 10m/s?
9. A body of mass 4kg initially at rest is subject to a force 16N.What is the kinetic energy acquired by the body at the end of 10s?
10. A body of mass 2kg is resting on a rough horizontal surface. A force of 20N is now applied to it for 10 sec. parallel to the surface. If the coefficient of kinetic friction between the surfaces in contact is 0.2, calculate:
    a) Work done by the applied force in 10s.
    b) Change in kinetic energy of the object in 10 s.