neway challenge academy no.1

2019/20 Academic Year

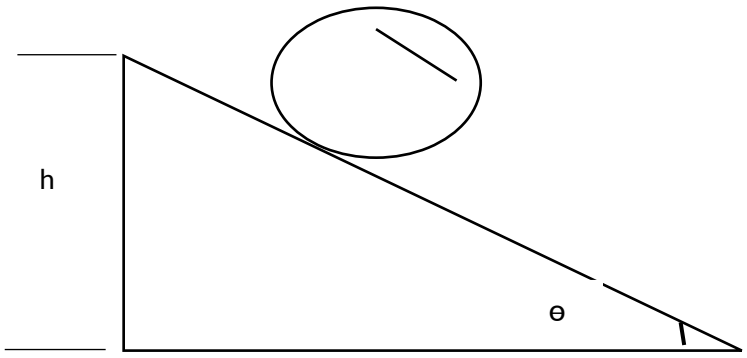
Second Semester Worksheet - II

Name: _____ Grade **11** Section: _ __ R.No: _ __

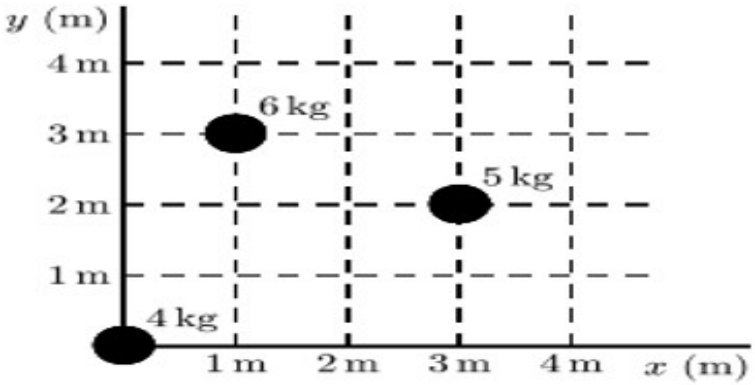
Date: _____ ___ Value **%** Subject: **Physics**

I. Solve the following problems by showing the necessary steps

1. A body of mass 20kg is initially moving with a speed of 8m/s. when a force of 60N now applied on the body for 3seconds.
   A. How much work has been done during this period?
   B. What is its initial and final kinetic energy?
   C. What is the distance covered at $t=4^{th}$sec?
   D. Show that the work done is equal to change of kinetic energy?
2. A force F= (8i +6j) acts on the particle to gives displacement of S= (4i +3j). compute.
   A. Magnitude of displacement
   B. Work done on the particles
   C. magnitudes of force
   D. the angle b/n force and displacement
3. A ball is dropped from rest at height of 20m. if its losses 25% of its kinetic energy when it strikes the ground. what is the height to which it bounces?
4. A car of mass 1000kg is moving at speed of 108km/h. Brakes are applied and the stop at distance of 20m from the braking point. What is the average force applied by braking? If the car stops in 30sec after braking. Calculate the average power of braking.
5. Shiela stands the center of rotating platform that has frictionless bearings. He holds 3kg object in each hand at 2m from the axis of rotation of the system. The system initially rotates 10 revolution per minutes. Calculate
   A. Initial angular velocity
   B. Angular velocity after the object brought to a distance of 2m from the axis of rotation
   C. The change in kinetic energy of the system
   D. If the kinetic energy increased, what is the cause of this increase? (assume that the moment of inertia of shiela and platform I_{sp} stays constant 2kg. m^2)
6. suppose rigid body has mass M, radius R and moment of inertia I. it is rolling down on an inclined plane of height h as shown in the figure below. At the end of its journey, it has acquired linear velocity v and angular velocity ω. Compute velocity v in terms of h.
   a. if the surface is frictionless
   b. if the coefficient of friction b/n the surface with body is μ= 0.2



7. A pulley with rotational inertia of $1x10^{-3}$ kg. m^2 about its axle and a radius of 10c.m is acted on by a force applied tangentially at its rim. The force magnitude varies in time of $F(t)= 2t+4t^2$, with F in Newton's and t in seconds. The pulley is initially at rest. What is the angular speed after time t = 3 seconds?
8. A 1kg mass is traveling at a speed of 10m/s on a horizontal surface. If the car comes to rest after traveling 10m distance. What force of friction tends to stop?
9. A machine raised a car of mass 2000kg through a height of 3m in one minute. If the efficiency of the machine is 50%, what is the power input of the machine? ($g=10m/s^2$)
10. The x and y coordinate of the center of mass of the three particles system shown belew are:



11. A block is released from rest at point P and slidesalong the frictionless track as shown below. What will be its speed at point Q?

