PHYS101_031 EXAM 2

Q1 Q0 You are supposed to pull a 2000 kg equipment across a horizontal
Q0 frozen lake by means of a horizontal rope. The coefficient of
Q0 kinetic friction is 0.05. The amount of work you will do by
Q0 pulling the equipment 100 m at constant velocity is:
Q0
A1 98 kJ
A2 20 kJ
A3 130 kJ
A4 -300 kJ
A5 0 kJ
Q0

Q2 Q0 A particle moves from Xi = 0 to Xf = 5.0 m while being acted
Q0 upon by a single force F = 3*X**2 directed along the X axis.
Q0 Find the change in the kinetic energy during this motion.
Q0
A1 125 J
A2 5 J
A3 0 J
A4 75 J
A5 250 J
Q0

Q3 Q0 Which of the following five quantities DOES NOT HAVE THE UNIT
Q0 OF ENERGY? Here m is a mass, g is the acceleration due to
Q0 gravity, h and d are distances, F is a force, v is a speed, a
Q0 is an acceleration, P is power, and t is time.
Q0
A1 m*a
A2 F*d
A3 0.5*m*v**2
A4 m*g*h
A5 P*t
Q0

Q4 Q0 A 2.0 kg block starts from rest on a rough inclined plane that
Q0 makes an angle of 30 degrees with the horizontal. The
Q0 coefficient of kinetic friction is 0.20. As the block moves
Q0 2.0 m down the plane, the change in gravitational potential
Q0 energy of the block is:
Q0
A1 - 19.6 J
A2 0 J
A3 - 9.8 J
A4 – 29.4 J
A5 - 39.2 J
Q0

Q5 Q0 A projectile of mass 0.20 kg is fired with an initial speed of
Q0 20 m/s at an angle of 60 degrees above the horizontal. The
Q0 kinetic energy of the projectile at its highest point is:
Q0
A1 10 J
A2 40 J
A3 30 J
A4 5.0 J
A5 0 J
Q0

Q6 Q0 The simple pendulum shown in Fig 1 is released from rest at
Q0 point (A) which is 0.5 m above its lowest point (B). The speed
Q0 of the ball at (B) is:
Q0

PHYS101 Second Major Exam Term-032

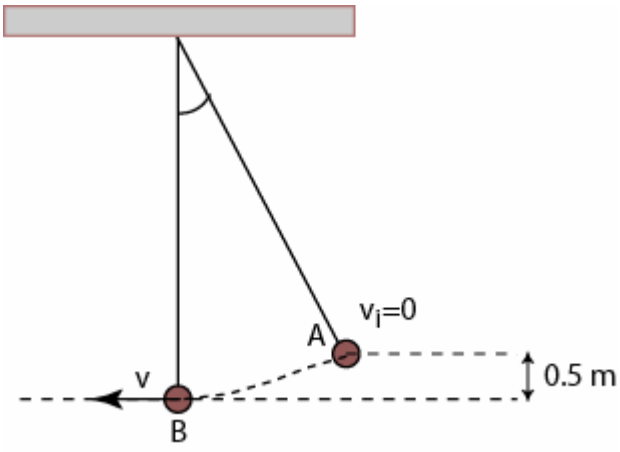

Figure 1

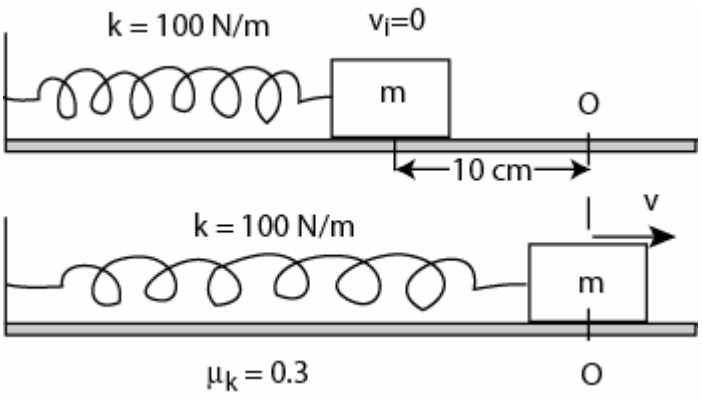

Figure 2

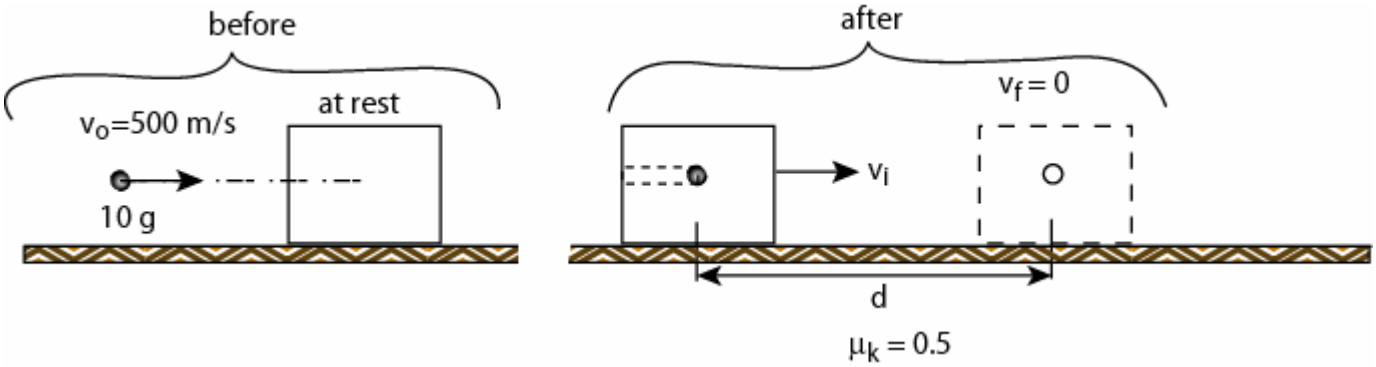

Figure 3

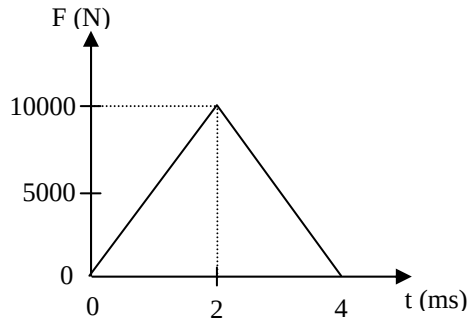

Figure 4

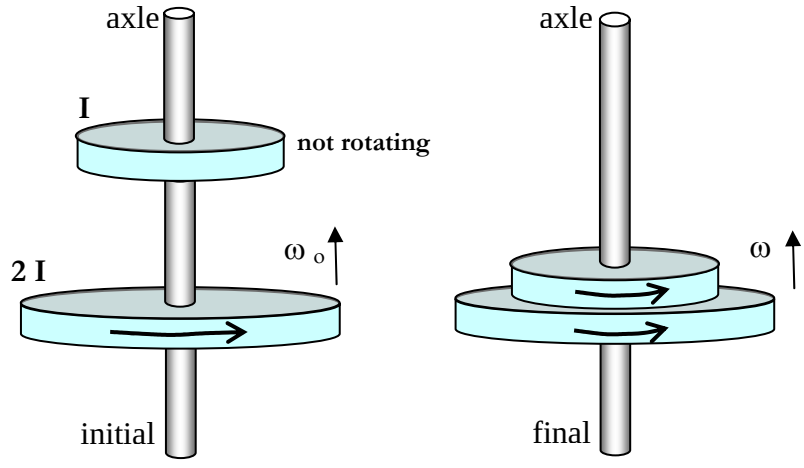

Figure 5

A1 3.1 m/s
A2 4.2 m/s
A3 5.8 m/s
A4 20 m/s
A5 0 m/s
Q0

Q7 Q0 A 0.50 kg block attached to a spring with a spring constant of
Q0 100 N/m moves on a horizontal surface having a coefficient of
Q0 kinetic friction 0.3 (see Fig 2). The spring is initially
Q0 compressed by 10 cm from the unstretched position O and then
Q0 released from rest. The speed of the block when it passes
Q0 through the point O is:
Q0
A1 1.2 m/s
A2 3.2 m/s
A3 5.5 m/s
A4 7.8 m/s
A5 1.4 m/s
Q0

Q8 Q0 A 10 gram bullet is shot in the +x-direction with a speed of
Q0 Vo = 500 m/s into a stationary block of wood that has a mass of
Q0 5.0 kg (see Fig 3). The bullet embeds itself in the block. What
Q0 distance (d) will the block slide on a surface having a
Q0 coefficient of kinitic friction equal to 0.5?
Q0
A1 10 cm
A2 50 cm
A3 100 cm
A4 5 cm
A5 2 cm
Q0

Q9 Q0 A 10 kg bomb at rest explodes, breaking into three pieces of
Q0 masses 2.0 kg, 2.0 kg, and 6.0 kg. The two 2.0 kg pieces fly
Q0 off perpendicular to each other, one along the +x-axis and
Q0 the other along the +y-axis, with the same speed 30 m/s. Find
Q0 the speed of the 6.0 kg piece.
Q0
A1 14 m/s
A2 30 m/s
A3 60 m/s
A4 10 m/s
A5 0 m/s
Q0

Q10Q0 Three particles are placed in the xy-plane. A 4.0 kg particle
Q0 is located at (3.0, 4.0) m and a 6.0 kg particle is located at
Q0 (-2.0, -6.0) m. Find the location of a 2.0 kg particle so that
Q0 the center of mass of this three-particle system is located at
Q0 the origin.
Q0
A1 (0, 10)
A2 (3, -2)
A3 (3, -6)
A4 (-2, 4)
A5 (0, 0)
Q0

Q11Q0 A ball having a mass of 35 grams strikes a wall with a velocity
Q0 of 8 m/s perpindicular to the wall and rebounds in the opposite
Q0 direction with only 50 % of its initial kinetic energy.
Q0 What is the magnitude of the impulse that acts on the ball
Q0 while it is in contact with the wall during collision?

Q0
A1 0.48 kg*m/s
A2 3.30 kg*m/s
A3 5.45 kg*m/s
A4 1.34 kg*m/s
A5 0.08 kg*m/s
Q0
Q12Q0 Fig 4 shows a plot of the force versus time (in millisecond)
Q0 during the collision of a ball with a wall. Find the magnitude
Q0 of the impulse delivered to the ball by the wall.
Q0
A1 20 kg*m/s
A2 80 kg*m/s
A3 50 kg*m/s
A4 10 kg*m/s
A5 40 kg*m/s
Q0
Q13Q0 Body A with mass m moves along an x axis with kinetic energy of
Q0 9.0 J before having an elastic collision with body B with the
Q0 same mass m , which is initially at rest. What is the final
Q0 kinetic energy of B?
Q0
A1 9.0 J
A2 8.0 J
A3 4.5 J
A4 3.0 J
A5 6.0 J
Q0
Q14Q0 A wheel, initially at rest, has a constant angular acceleration.
Q0 The wheel completes 71 revolutions in 9.0 s. Its angular
Q0 acceleration in rad/s**2 is:
Q0
A1 11
A2 1.7
A3 50
A4 10
A5 15
Q0
Q15Q0 The rotational inertia of a solid object rotating about an axis
Q0 DOES NOT DEPEND UPON ITS:
Q0
A1 angular speed
A2 mass
A3 distribution of mass
A4 geometry (the shape of the object)
A5 axis of rotation
Q0
Q16Q0 A disk has a rotational inertia of 6.0 kg*m**2 and a constant
Q0 angular acceleration of 2.0 rad/s**2. If it starts from rest the
Q0 work done during the first 5.0 s by the net torque acting on it
Q0 is:
Q0
A1 300 J
A2 30 J
A3 120 J
A4 0   J
A5 600 J
Q0
Q17Q0 A uniform wheel of radius 0.5 m rolls without slipping on a
Q0 horizontal surface. Starting from rest, the wheel moves with

Q0 constant angular acceleration 6.0 rad/s**2. The distance
Q0 traveled by the center of mass of the wheel from t = 0 to
Q0 t = 3 s is:
Q0
A1 13.5 m
A2 27 m
A3 zero m
A4 18 m
A5 none of other answers
Q0
Q18Q0 A 2.0 kg stone is tied to a 0.50 m string and swung around
Q0 a circle at a constant angular velocity of 12 rad/s. The net
Q0 torque on the stone about the center of the circle is:
Q0
A1 0 N*m
A2 6.0 N*m
A3 12 N*m
A4 72 N*m
A5 140 N*m
Q0
Q19Q0 A stone in the form of a uniform circular disk of radius
Q0 0.20 m and mass 14 kg can rotate about its axis. Starting
Q0 from rest, it reaches an angular velocity of 44 rad/s in 10 s
Q0 under the action of a constant torque. What is the
Q0 instantaneous power at the end of this time interval?
Q0
A1 54 W
A2 110 W
A3 75 W
A4 3 W
A5 0 W
Q0
Q20Q0 A disk (rotational inertia = 2*I) rotates with angular velocity
Q0 Wo about a vertical, frictionless axle. A second disk
Q0 (rotational inertia = I) and initially not rotating, drops onto
Q0 the first disk (see Fig 5). The two disks stick together and
Q0 rotate with an angular velocity W. Find W.
Q0
A1 (2/3)*Wo
A2 (1/2)*Wo
A3 (3/4)*Wo
A4 Wo
A5 2*Wo