Academic Year: 2018/2019
Revision sheet
Physics / Grade 11

Chapter 5 , Section :1,2,3,4 Chapter 6, Section :1,2

Name : _____ Date : / 3 / 2019

Q1. Write the letter of the correct answer in the space provided.

_____ 1. How does the kinetic energy of an object change if the object's speed doubles?
a. The kinetic energy decreases to half its original value.
b. The kinetic energy doubles.
c. The kinetic energy increases by a factor of 4.
d. The kinetic energy does not change.

_____ 2. Friction does –400 J of net work on a moving car. How does this affect the kinetic energy of the car?
a. The kinetic energy increases by 400 J.
b. The kinetic energy decreases by 400 J.
c. The kinetic energy decreases by 160 kJ.
d. The kinetic energy does not change.

_____ 3. Mechanical energy is *not* conserved when
a. gravitational potential energy is converted to kinetic energy.
b. kinetic energy is converted to gravitational potential energy.
c. kinetic energy is converted to elastic potential energy.
d. friction is not negligible.

_____ 4. If mechanical energy is conserved in a system, the energy at any point in time can be in the form of
a. kinetic energy.
b. gravitational potential energy.
c. elastic potential energy.
d. all of the above

_____ 5. How much work can a motor with a power output of 25 W do in 1 s?
a. $\frac{1}{25}$ J c. 25 J
d. 25 W b. 1 J

_____ 6. Which of the following has the greatest momentum?
a. a 4.0 kg bowling ball moving at 2.0 m/s
b. a 0.15 kg baseball moving at 10.0 m/s
c. a 1.6×10^3 kg car moving at 0.5 m/s
d. a 0.02 kg bullet moving at 950 m/s

_____ 7. How does the momentum of an object change if the object's velocity doubles?
   a. The momentum doubles.
   b. The momentum increases by a factor of four.
   c. The momentum decreases by a factor of 1/2.
   d. The momentum decreases by a factor of 1/4.

_____ 8. Which of the following involves a change in momentum?
   a. A bowling ball rolls down the lane at constant speed.
   b. A car coasts down a hill at constant speed.
   c. A sky diver descends with terminal velocity.
   d. A spacecraft travels at constant speed while slowly losing mass.

Q2. Which has more kinetic energy, a 4.0 kg bowling ball moving at 1.0 m/s or a 1.0 kg bocce ball moving at 4.0 m/s? Explain your answer.

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Q3. A tennis ball is thrown up into the air starting from a height of 1.5 m. The ball reaches a peak height, then falls down to the ground. Assuming air resistance is negligible, describe the energy transfers that take place during the flight of the ball. Is mechanical energy conserved in this situation?

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Q4. Describe the relationship between energy, time, and power.

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Q5. Define impulse, and state the impulse-momentum theorem.

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Q6. Describe the changes in momentum that take place when two billiard balls of equal mass but moving at different speeds collide head-on.

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PROPLEM SOLVING :

Q7. A 55 kg boy running at 2.0 m/s jumps onto a 2.0 kg skateboard. Calculate the final velocity of the boy and the skateboard.

Q8. An egg suspended above the ground has 2.0 J of gravitational potential energy. The egg is then dropped and falls to the ground. What is the kinetic energy of the egg just as it reaches the ground?

Q9. A 1.0 × 104 kg spacecraft is traveling through space with a speed of 1200 m/s relative to Earth. A thruster fires for 2.0 min, exerting force of 25 kN on the spacecraft in a direction opposite the spacecraft's motion. Calculate the initial momentum and the final momentum of the spacecraft.

Q10. A croquet ball moving at 2.0 m/s strikes another ball of equal mass. The first ball stops moving after the collision. What is the velocity of the second ball after the collision?

Q11. An engine uses 29 kN of force to power a car at an average speed of 7.5 m/s. What is the average power output of the engine?

Q12: A 1.0×10^3 kg sports car is initially traveling at 15 m/s. The driver then applies the brakes for several seconds so that −25 kJ of net work is done on the car. Calculate the initial and final kinetic energy of the car.

Q13. A child pulls a wagon 3.0 m using a force of 55 N at an angle 35° above horizontal. The force of friction on the wagon is 12 N. Calculate the net work done on the wagon.

Q14. Tom and his twin brother Tim have a combined mass of 200.0 kg and are zooming along in a 100.0-kg amusement park bumper car at 10.0 m/s. They bump Melinda's car, which is sitting still. Melinda has a mass of 25.0 kg. After the elastic collision, the twins continue ahead with a speed of 4.12 m/s. How fast is Melinda's car bumped across the floor?

Q15. Sometimes the curiosity factor at the scene of a car accident is so great that it actually produces secondary accidents as a result, while people watch to see what is going on. If an 800 kg sports car slows to 13.0 m/s to check out an accident scene and the 1200 kg pick-up truck behind him continues traveling at 25.0 m/s, with what velocity will the two move if they lock bumpers after a rear-end collision?

Q16. An ideal 200 kg boulder is at rest 1000 m above the ground.

a) What is its potential energy when it is 1000 m above the ground?

b) What is its kinetic energy when it is 1000 m above the ground?

c) The boulder begins to fall. What is its potential energy when it is 500 m above the ground? Where did the "lost" potential energy go?

d) What is the kinetic energy of the boulder when it has fallen 500 m?

e) What is the kinetic energy of the boulder just before it hits the ground?

Q17. An ideal pendulum has 15 J of potential energy at the top of its swing
-What is its kinetic energy at the bottom of its swing?

-What is its kinetic energy when it has 8 J of potential energy?

Q18. A 3.2 kg ball that is moving straight upward has 17 J of kinetic energy and its total mechanical energy is 25 J.

a. Find the gravitational potential energy of the ball.

b. What is its height above the ground?

c. What is the speed of the ball?

d. What will be its gravitational energy when it is at its highest point above the ground?

e. What is its maximum height above the ground?

f. What will be its speed just before it lands on the ground?