## WORK, ENERGY AND POWER TEST REVIEW

1. Write the define the following and write the symbols used to describe
   1. Alpha particle
   2. Beta particle
   3. Gamma ray
2. Write the standard atomic notation for the three isotopes of hydrogen.
3. For the following nuclei, determine the daughter element
   1. undergoing alpha decay
   2. undergoing alpha decay
   3. undergoing beta decay
   4. undergoing beta decay
   5. undergoing gamma decay
4. Describe how a CANDU reactor works. List the benefits of nuclear energy and the drawbacks.
5. Give an example of a situation in which
   1. A force is acting but there is no motion and therefore no work done.
   2. A force is acting, but the displacement is perpendicular to the force and therefore no work is done.
6. How much work must be done to lift a 20 kg sack of potatoes vertically 6.5 m?
7. A 6.0 g pellet of lead at 32°C gains 36.8 J of heat. What will be its final temperature?
8. When 2.1 x 103 J of heat energy is added to 0.1 kg of a substance, its temperature increases from 19°C to 44°C. What is the specific heat capacity of the substance?
9. A boy on a bicycle drags a wagon full of newspapers at 0.80 m/s for 30 minutes using a force of 40 N. How much work has the boy done?
10. A coconut falls out of a tree 12.0 m above the ground and hits a bystander 1.80 m tall on top of the head. It bounces back up 0.50 m before falling to the ground. If the mass of the coconut is 2.00 kg, calculate the potential energy of the coconut relative to the ground at each of the following times.
    1. While it is still in the tree.
    2. When it hits the bystander on the head.
    3. When it bounces up to the maximum height.
    4. When it lands on the ground.
    5. When it rolls into a groundhog hole and falls 2.50 m to the bottom of the hole.
11. A 50 kg cyclist on a 10 kg bicycle speeds up from 5.0 m/s to 10.0 m/s.
    1. What was the total kinetic energy before accelerating?
    2. What was the total kinetic energy after accelerating?
    3. How much work was done in increasing the kinetic energy of the cyclist?
    4. Is it more work to speed up from 0 to 5.0 m/s than from 5.0 m/s to 10.0 m/s?
12. A rodeo rider is riding a bucking bronco when he is thrown off. At the instant he leaves the horse he is located 1.6 m above the ground and is moving straight up at 4.0 m/s.
    1. What maximum height above the ground will the rider reach?
    2. At what speed will the rider hit the ground?
13. A 60 kg man and a 40 kg girl sit on identical swings. They are then each given a push so that in both cases the swings move through the same angle from the vertical. How will their speeds compare as they swing through the bottom of the cycle? Explain your answer.
14. How much work can a 22 kW car engine do in 60 s
    1. If it is 100% efficient?
    2. If it is 30% efficient?

**ADDITIONAL QUESTIONS IN THE TEXTBOOK**

As well as reviewing all of the homework questions, you could also complete any of:

p. 362 # 1 – 9, 11 – 13, 16 – 21, 23, 24, 27, 31, 33, 34

p. 365 # 33 and on