**Yr 10 Physics revision**

1. A 70kg tourist fell from a lookout at Hancock Gorge in Karijini Park. He hit a pool of water at the bottom of the gorge with a velocity of 30ms-1. Determine:

a) the loss of potential energy of the tourist.

b) the height of the lookout from the pool.

2. A 5kg cat fell from a tree and hit the ground at 15ms-1. How high is the branch from which she fell off?

3. A 0.2 kg disc is fired from a disc shooter at 80ms-1 as a practice for a sharp shooter. Determine:

a) the kinetic energy.

b) the potential energy.

When its upward velocity is reduced to 15ms-1.

4. What is the gain in potential energy of a 0.6N yoyo when it is raised 80cm above its lowest point?

5. How much work must be done on a 600g soccer ball to accelerate it from rest at 3.8ms-2 for 4 seconds?

6. What loss of kinetic energy occurs as the speed of a 3g bullet is reduced to 120ms-1 from 700ms-1?

7. A stationary barrel of a mass 200kg is hit by a car imparting a force three times its weight. Determine after 2 seconds:

a) velocity

b) displacement.

8. How much work is done by a crane lifting a car of mass 2500kg, 5 meters high.

9. What loss of kinetic energy occurs as the speed of a bike is reduced from 14ms-1 to

7ms-1 ? The mass of the bike and cyclist is 90kg.

10. A desk of mass 50kg requires a force of 12N to overcome friction so that it can be

moved at constant velocity over a distance of 2m.

a) How much work is required?

b) What additional work would have been required if the desk had been accelerated

at 0.5ms-2 for the 2m shift?

11. A runaway train of mass 15000kg travelling at 15ms-1 at level ground comes to a stop going up a hill. Determine the height attained by the truck.

12. Kirsten dropped her hat with a mass of 300g to the floor. The hat hit the floor with kinetic energy of 5.2J. How tall is Kirsten?

13.A bird carrying a 5g worm in its mouth is flying at a speed of 12m/s at 250m above ground.

1. Calculate the kinetic energy of the worm.
2. Calculate the potential energy of the worm.
3. Calculate the total energy of the worm.
4. The bird drops the worm into its nest. The worm hits the nest with a kinetic energy of 6J. How high was the bird above the nest before it dropped it?

14. An 1800kg car decelerated from 84km/h to 40km/h. How much work has been done on the car?

15. A 25kg bike is freewheeling along a road at 20m/s and begins to climb a hill.

a) Determine its potential energy.

b) To what vertical height would it have climbed?

16. Determine the weight of a person with a mass 65kg when standing on a planet 1/3 the gravitational force of earth.

17. A bus travels 1800m in 5 seconds against a frictional resistance of 5000N. What power is the bus developing?

18. An encyclopaedia of mass 11kg is dropped from a top shelf in the library. How high is the shelf if the velocity of the book upon striking the ground is 18m/s?

19. A pigeon is flying in a straight line 30m above ground at 65m/s towards its nest drops a 5g worm.

a) What is the kinetic energy of the worm the moment it is dropped?

b) What is the total energy of the worm when first dropped?

20. A 60kg diver jumping from a platform did 1860J of work just before hitting the surface of the water. Determine the height of the platform.

21. Determine the power needed to accelerate a bike from 6.6m/s to 9.75m/s in 4seconds over a distance of 25m, given the compound mass of bike and rider is 70kg.

a = (9.75-6.6) / 4

22. Calculate the time in minutes (to 2 decimal place) if it takes 50W to stop a derailed train using 7000N of frictional force applied over a 35m distance.

23. A force of 490 N is used to lift a barbell weighing 300 N. Calculate the acceleration of the barbell.

24. A 40kg mass falls from a height of 8.5 m to the surface of planet Krypton where acceleration due to gravity is 20ms-2. Determine the time taken to hit the surface.

NB. Question 17 is taken out. So I guess you only have 24 Questions! ENJOY ☺

ANSWERS

1a). 31500J

1b) 45.9m

2) 11.48m (Requires 2 steps to solve)

3a) 22.5J

3b) 617.5J

4) 0.48J

5) 69.3J (Requires 2 steps to solve)

6) -713.4J

7a) 58.8m/s (Requires 3 steps to solve)

7b) 58.5m

8) 122500J

9) 6615J lost

10a) 24J

10b) 50J

11) 11.48m

12) 1.77m

13a) 0.36J

13b) 12.25J

13c) 12.61J

13d) 122.45m

14) -378810J

15a) 5000J

15b) 20.4m

16) 212.6N (Requires 2 steps to solve)

17) 1800kW

18) 16.5m

19a) 10.56J

19b) 12.03J (Requires 2 steps to solve)

20) 3.16m

21) 345.63W

22) 4900s

23) 6.21m/s2 (Requires 2 steps to solve)

24) 0.92s