

 **FOR ALL QUESTIONS TAKE g = 9.81 N kg-1**

1) A force moves an object in the direction of the force.

 The graph in Fig. 1 shows the force versus the object's position.

 Find the work done when the object moves from 0.0 to 2.0 m.

A) 2.0 x 101 J

B) 4.0 x 101 J

C) 6.0 x 101 J

D) 8.0 x 101 J

2) A force moves an object in the direction of the force. The graph in question 37)shows the force

 versus the object's position. Find the work done when the object moves from 2.0 to 4.0 m.

A) 2.0 x 101 J

B) 4.0 x 101 J

C) 6.0 x 101 J

D) 8.0 x 101 J

3) A force moves an object in the direction of the force. The graph in question 37 ) shows the force

 versus the object's position. Find the work done when the object moves from 4.0 to 6.0 m.

A) 2.0 x 101 J

B) 4.0 x 101 J

C) 6.0 x 101 J

D) 8.0 x 101 J

4) A force moves an object in the direction of the force. The graph in question 37) shows the force

 versus the object's position. Find the work done when the object moves from 0.0 to 6.0 m.

A) 2.0 x 101 J

B) 4.0 x 101 J

C) 6.0 x 101 J

D) 8.0 x 101 J

5) Of the following, which is not a unit of power?

A) watt/second B) newton meter/second

C) joule/second D) watt

6) Compared to yesterday, you did 3 times the work in one-third of the time. To do so, your power output

 must have been

A) the same as yesterday's power output.

B) one-third of yesterday's power output.

C) 3 times yesterday's power output.

D) 9 times yesterday's power output.

7) To accelerate your car with constant acceleration, the car's engine must

A) maintain a constant power output.

B) develop ever-decreasing power.

C) develop ever-increasing power.

D) maintain a constant speed of rotation.

8) State the work-energy principle.

Answer: The net work done on an object is …………….. to the ………………… in the object's kinetic energy.

9) State the law of conservation of energy.

Answer: The ……………… energy is neither ………………………….. nor …………………………. in any process. Energy can be ………………………….. from one form to another, and transferred from one object to another, but the ……………………. amount remains ………………………...

10) A lightweight object and a very heavy object are sliding with equal speeds along a level frictionless

 surface. They both slide up the same frictionless hill. Which rises to a greater height?

A) The heavy object, because it has greater kinetic energy.

B) The lightweight object, because it weighs less.

C) They both slide to the same height.

D) Cannot be determined from the information given

11) Consider two masses m1 and m2 at the top of two frictionless inclined planes. Both masses start from

 rest at the same height. However, the plane on which m1 sits is at an angle of 30° with the horizontal,

 while the plane on which m2 sits is at 60°. If the masses are released, which is going faster at the

 bottom of its plane?

A) m1

B) m2

C) They are both moving at the same speed.

D) Cannot be determined without knowing the masses

12) A ball falls from the top of a building, through the air (air friction is present), to the ground below.

 How does the kinetic energy (K) just before striking the ground compare to the potential energy (U)

 at the top of the building?

A) K is equal to U.

B) K is greater than U.

C) K is less than U.

D) It is impossible to tell.

13) A ball drops some distance and loses 30.0 J of gravitational potential energy. Do not ignore air

 resistance. How much kinetic energy did the ball gain?

A) more than 30.0 J

B) exactly 30.0 J

C) less than 30.0 J

D) cannot be determined from the information given.

14) A horizontal force of 2.0 x 102 N is applied to move a 55 kg cart (initially at rest) across 10.0 m level

 surface. What is the final kinetic energy of the cart?

A) 1.0 × 103 J

B) 2.0 × 103 J

C) 2.7 × 103 J

D) 4.0 × 103 J

15) A 10.0 kg mass is moving with a speed of 5.00 m s-1. How much work is required to stop the mass?

A) 50.0 J

B) 75.0 J

C) 1.00 x 102 J

D) 125 J

16) If it takes 50.0 m to stop a car initially moving at 25 m s-1, what distance is required to stop a car

 moving at 50.0 m s-1 if the braking force is the same in both cases.

A) 50.0 m

B) 1.0 x 102 m

C) 2.0 x 102 m

D) 4.0 x 102 m

17) An arrow of mass 20.0 g is shot horizontally into a bale of hay, striking the hay with a velocity of

 60.0 m s-1. It penetrates a depth of 20.0 cm before stopping. What is the average stopping force acting

 on the arrow?

A) 45.0 N

B) 90.0 N

C) 180 N

D) 360 N

18) A 15.00 kg object is moved from a height of 7.000 m above a floor to a height of 13.00 m above the

 floor. What is the change in gravitational potential energy? ( g = 9.81 N kg-1).

A) zero

B) 883 J

C) 1.18 kJ

D) 1.91 kJ

19) A box of weight 4.0 x 102 N is pushed up an inclined plane. The plane is 4.0 m long and rises

 2.0 m vertically. If the plane is frictionless, how much work was done by the push?

A) 1.6 x 103 J

B) 8.0 x 102 J

C) 4.0 x 102 J

D) 1.0 x 102 J

20) The quantity Fd/t is :- ( F = force, d = displacement, t = time )

A) the kinetic energy of the object.

B) the potential energy of the object.

C) the work done on the object by the force.

D) the power supplied to the object by the force.

21) What is the correct unit of power expressed in SI units?

A) kg m s-2

B) kg m2 s-2

C) kg m2 s-3

D) kg2 m s2

22) An object slides down a frictionless inclined plane. At the bottom, it has a speed of 9.80 m s-1.

 What is the vertical height of the plane? ( g = 9.81 N kg-1)

A) 19.6 m

B) 9.80 m

C) 4.90 m

D) 2.45 m

23) A roller coaster starts from rest at a point 45 m above the bottom of a dip (See Fig.). Neglect friction,

 what will be the speed of the roller coaster at the top of the next slope, which is 30.0 m above the

 bottom of the dip?

A) 14 m s-1

30.0 m

Fig 1

B) 17 m s-1

C) 24 m s-1

D) 30 m s-1

24) A roller coaster starts with a speed of 5.0 m s-1 at a point 45 m above the bottom of a dip (See Fig.1)

 Neglect friction, what will be the speed of the roller coaster at the top of the next slope, which is

 30.0 m above the bottom of the dip?

A) 12 m s-1

B) 14 m s-1

C) 16 m s-1

D) 18 m s-1

25) A roller coaster starts at a point 30.0 m above the bottom of a dip with a speed of 25 m s-1 (See

 Fig.1). Neglect friction, what will be the speed of the roller coaster at the top of the next slope,

 which is 45 m above the bottom of the dip?

A) 14 m s-1

B) 16 m s-1

C) 18 m s-1

D) 20 m s-1

26) What is the minimum speed of the ball at the bottom of its swing (point B) in order for it to reach

 point A, which is 1.0 m above the bottom of the swing?



A) 2.2 m s-1

B) 3.1 m s-1

C) 4.4 m s-1

D) 4.9 m s-1

27) A 60.0 kg skier starts from rest from the top of a 50.0 m high slope. If the work done by friction is

 6.0 × 103 J, what is the speed of the skier on reaching the bottom of the slope?

A) 17 m/s

B) 28 m/s

C) 34 m/s

D) 31 m/s

Below are the answers to the MC questions.

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