

Grade 11 advanced
Chapter 6 (Potential energy and energy conservation)
Review

Chose the correct answer for each of the following question:

1- A ball with mass of 0.3 kg is thrown vertically upward from the level of the ground and reaches a height of 12 m, what is the gravitational potential energy of the ball at that height?

- A. 19.4 J
- B. 20.8 J
- C. 28.6 J
- D. 35.3 J

2- A 15 kg object is fall down from a height of 120 m to a height of 90 m from the level of the ground, what is the change in its gravitational potential energy?

- A. -2.9×10^3 J
- B. $+2.9 \times 10^3$ J
- C. $+4.4 \times 10^3$ J
- D. -4.4×10^3 J

3- At what height from the ground level, a 5.2 kg object can store a gravitational energy of 1200 J?

- A. 23.5 m
- B. 22.1 m
- C. 19.4 m
- D. 16.7 m

4- How will the gravitational energy of an object change, if the object height from the ground level is doubled?

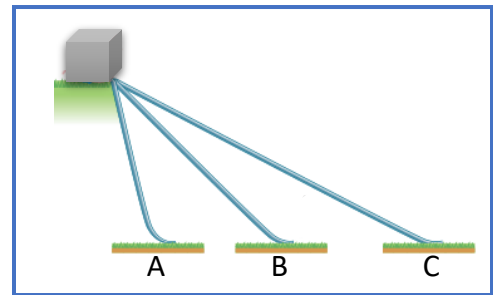
- A. It will increase by a factor of 2
- B. It will reduce by a factor of $1/2$
- C. It will increase by a factor of 4
- D. It will reduce by a factor of $1/4$

5- An object has a mass of m , is lifted from height of $h/4$ to height of $h/3$ where the gravitational potential energy of the object is 120 J, what is the change in the gravitational potential energy of the object?

- A. 60 J
- B. 50 J
- C. 40 J
- D. 30 J

6- An object slides down three different times, each time it slides on different frictionless incline as shown in the figure, at the end of which incline the work done by gravity is the largest?

- A. Incline A
- B. Incline B
- C. Incline C
- D. It is the same on all inclines

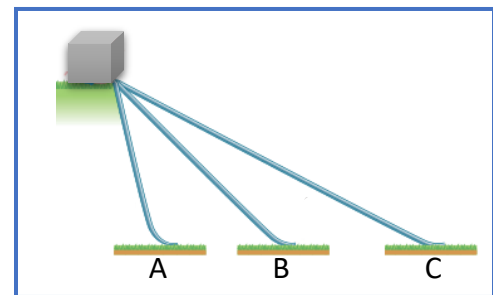


7- A spring with constant 250 N/m is compressed 12 cm from its equilibrium position what is the potential energy stored in the spring?

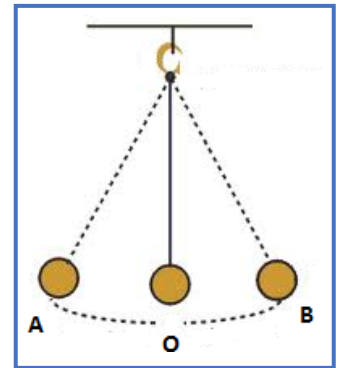
- A. 1.8 J
- B. 3.6 J
- C. 9.0 J
- D. 12 J

8- An object slides down three different times, each time it slides on different frictionless incline as shown in the figure, on which incline the speed of the object will be the largest at the instant of touching the ground?

- 1. Incline A
- 2. Incline B
- 3. Incline C
- 4. It is the same on all inclines

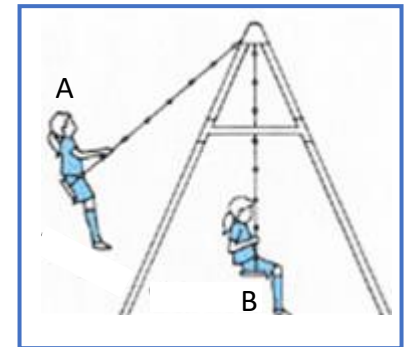


- 9- A simple pendulum vibrates between point A and point B, at what point the kinetic energy of the pendulum bob is the largest?



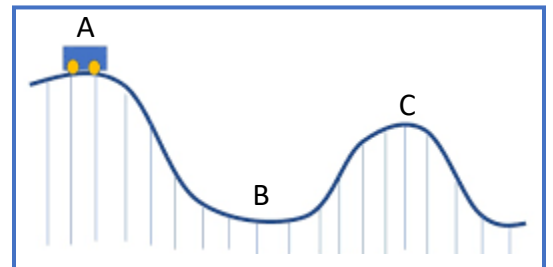
- A. Point A.
- B. Point O**
- C. Point B
- D. It is the same at all points

- 10- The rope of the swing shown in the figure has length of 1.2 m, if the swing starts moving from rest at point A where the rope makes an angle of 60° with the vertical, what is the speed of the swing at point B?



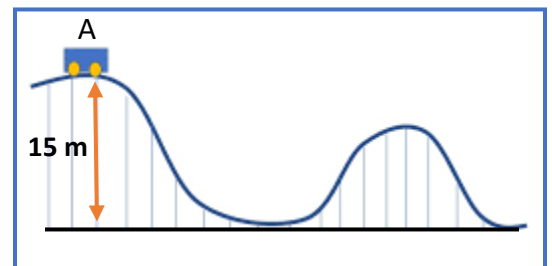
- A. 3.4 m/s**
- B. 2.9 m/s
- C. 2.1 m/s
- D. 1.7 m/s

- 11- If the roller coaster shown in the figure starts moving from rest from point A, at what point of the path, the mechanical energy of the coaster is the largest (neglect the friction force in this motion)?



- A. Point A
- B. Point B
- C. Point C
- D. It is the same at all points**

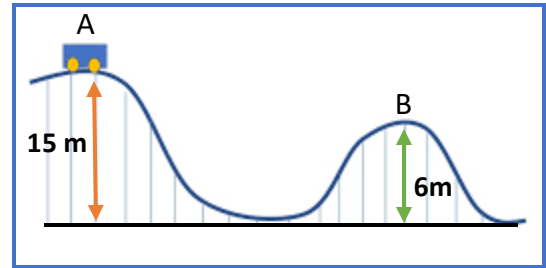
- 12- If the roller coaster shown in the figure starts moving down from rest from point A, at what height the speed of the coaster will be 3.5 m/s? (Neglect the friction force in this motion)?



- A. 12.1 m
- B. 13.6 m
- C. 14.4 m**
- D. 15.8 m

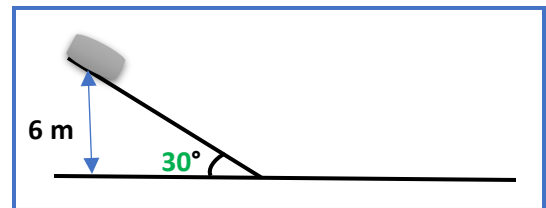
13- If the roller coaster shown in the figure starts moving from rest from point A, what is the speed of the coaster at point B? (Neglect the friction force in this motion)?

- A. 12.1 m/s
- B. 13.3 m/s**
- C. 14.5 m/s
- D. 15.8 m/s



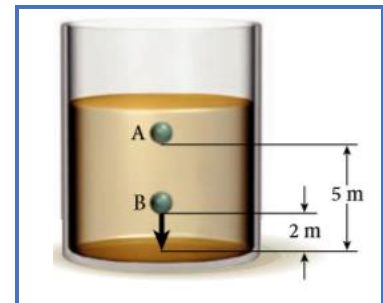
14- A 3.2 kg object slides down on a rough surface, the object starts moving from rest at 6.0 m height as shown in the figure, if the kinetic friction coefficient between the object and the path surface is 0.28, at what distance from the bottom of the incline the object will stop?

- A. 6.2 m
- B. 8.4 m
- C. 11 m**
- D. 12 m



15- A ball of mass 0.5 kg is released from rest at point A, which is 5 m above the bottom of a tank of oil, as shown in the figure. At B, which is 2 m above the bottom of the tank, the ball has a speed of 6 m/s. The work done on the ball by the force of fluid friction is:

- A. -5.7 J**
- B. +5.7 J
- C. -15 J
- D. +15 J



16- A spring has a spring constant of 120 N/m. How much potential energy does it store when stretched by 3.0 cm?

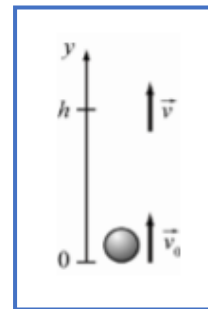
- A. 2.5×10^{-2} J
- B. 3.7×10^{-2} J
- C. 4.1×10^{-2} J
- D. 5.4×10^{-2} J**

17- A spring has a spring constant of 100 N/m is hanged to the ceiling, then a mass of 0.3 kg is hanged at the end of the spring, what distance will the spring extend?

- A. 3 cm
- B. 4 cm
- C. 5 cm
- D. 6 cm

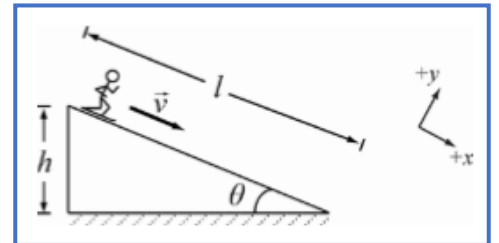
18- A large air-filled 0.100 kg plastic ball is thrown up into the air with an initial speed of 10.0 m/s. At a height of 3.00 m, the ball's speed is 4.00 m/s. What is the magnitude energy has been lost to air friction?

- A. 5.14 J
- B. 4.23 J
- C. 3.45 J
- D. 1.26 J



19- How much mechanical energy is lost to friction if a 60 kg skier slides down a ski slope at constant speed of 12 m/s? The slope is 110 m long and makes an angle of 30° with respect to the horizontal.

- A. 6.1×10^4 J
- B. 5.3×10^4 J
- C. 4.8×10^4 J
- D. 3.2×10^4 J



20- A 0.50-kg mass is attached to a horizontal spring with $k = 100$. N/m. The mass slides across a frictionless surface. The spring is stretched 25.0 cm from equilibrium, and then the mass is released from rest, what is the maximum speed of the mass.

- A. 7.1 m/s
- B. 5.3 m/s
- C. 4.9 m/s
- D. 3.5 m/s

21- A 0.30-kg mass is attached to a horizontal spring with $k = 120. \text{ N/m}$. The mass slides across a frictionless surface. The spring is stretched 30.0 cm from equilibrium, and then the mass is released from rest, what is the speed of the mass at a distance 5.0 cm from the equilibrium position?

- A. 6.1 m/s
- B. 5.9 m/s
- C. 4.7 m/s
- D. 3.2 m/s

22- A 1.0-kg block compresses a spring for which $k = 100. \text{ N/m}$ by 20.0 cm and is then released to move from rest across a horizontal, frictionless table. what is the total mechanical energy of the system?

- A. 6.5 J
- B. 3.1 J
- C. 2.0 J
- D. 1.5 J

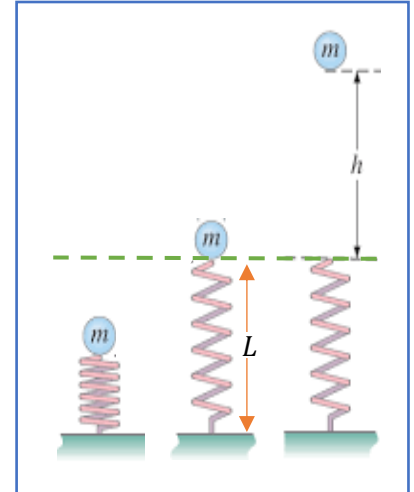
23- A block of mass 0.50 kg on a spring with spring constant 250 N/m oscillates vertically with amplitude 0.60 m. What is the speed of this block at a distance of 0.30 m from the equilibrium position?

- A. 13.4 m/s
- B. 12.5 m/s
- C. 11.6 m/s
- D. 10.2 m/s

24- A block of mass 0.50 kg on a spring with spring constant 250 N/m oscillates vertically with amplitude 0.60 m. What is the maximum speed of this block?

- A. 13.4 m/s
- B. 12.5 m/s
- C. 11.6 m/s
- D. 10.2 m/s

25- A vertical spring with $1200. \text{ N/m}$ spring constant and 3.00 m length is compressed 1.20 m from its equilibrium position, then a 12.0 kg mass is placed at the top of the spring as shown in the figure, what is the maximum height from the ground, that the mass reaches after the spring release to move freely. (Assume that the mass leaves the spring at its equilibrium position)



- A. 7.42 m
- B. 8.61 m
- C. 9.14 m
- D. 10.3 m

The end