



Physics

Second Secondary Grade

Home Work

Week

2

إعداد

عبد الله مصطفى - حسن أشرف

مراجعة

محمد عنتر

مكتب مستشار العلوم

عبد الله مصطفى - سعيد محمد

إشراف

د/عزيزه رجب خليفة
مستشار العلوم

إشراف عام

د/ هالة عبد السلام
رئيس الإدارة المركزية للتعليم العام

20
26

Name:
Class:
School:



Chapter 1| Energy

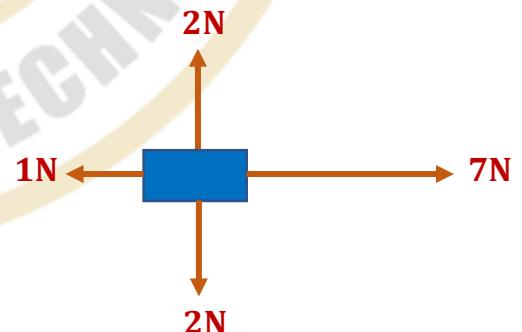
First: Multiple Choice Questions

1) A body has a kinetic energy of **2 J**. If its speed is doubled, its kinetic energy becomes ...

(A) 4 J
(B) 2 J
(C) 6 J
(D) 8 J

2) A car of mass **2000 kg** moves with a speed of **60 km/h**. Its kinetic energy is equal to
(A) 1.39×10^5 J
(B) 2.78×10^5 J
(C) 5.56×10^5 J
(D) 1×10^6 J

3) The figure shows a top view of the magnitudes and directions of four forces acting on a body placed on a horizontal surface. The change in the kinetic energy of the body while it is displaced through **4 m** is equal to
(A) 8 J
(B) 10 J
(C) 24 J
(D) 32 J

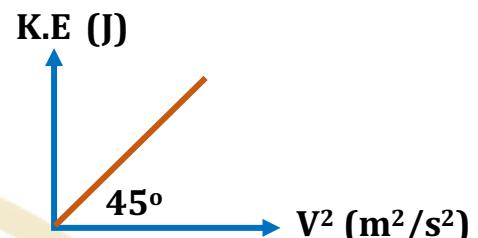




4) The opposite graph shows the relationship between the kinetic energy (KE) of a body of mass (m) and the square of its speed (v^2). The mass of the body is

(Given that both quantities are plotted on the axes using the same scale)

- (A) 0.5 kg
- (B) 1 kg
- (C) 2 kg
- (D) 5 kg

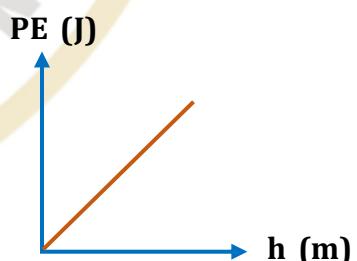


5) Two bodies have masses such that the mass of the first is **twice** the mass of the second, and the speed of the first is **half** the speed of the second. The kinetic energy of the first body is the kinetic energy of the second body.

- (A) half
- (B) double
- (C) quarter
- (D) four times

6) The opposite graph shows the relationship between potential energy (PE) and height (h). The unit of the slope is

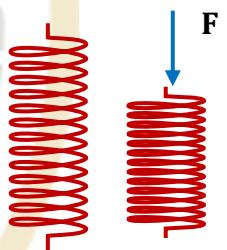
- (A) kg·m²·s²
- (B) kg·m²·s⁻²
- (C) kg·m·s²
- (D) kg·m·s⁻²





8) A man reaches his apartment once by climbing the stairs and once by using the elevator. Which of the following statements is correct?

- (A) The man's potential energy is greater when he climbs the stairs
- (B) The man's potential energy is greater when he uses the elevator
- (C) The man has no potential energy when using the elevator
- (D) The man's potential energy is the same in both cases



10) When a body falls from the top of a building of height (d) with an acceleration due to gravity (g) in a time (t), the value of the body's potential energy at the moment of release is

(A) equal to its kinetic energy
(B) double its kinetic energy
(C) its momentum
(D) maximum



11) Hassan wants to lift a box of mass (m) vertically through a distance of 1 m . The force required by Hassan is equal to

- (A) half the weight of the box
- (B) the weight of the box
- (C) one quarter of the weight of the box
- (D) one third of the weight of the box

12) If a body of mass 2 kg is at a height of 5 m above the ground, and $g = 9.8\text{ m/s}^2$, then its potential energy is

- (A) 9.8 J
- (B) 2.5 J
- (C) 10 J
- (D) 98 J

Second: Essay Questions

13) Two boxes (A) and (B) with weights 40 N and 60 N , respectively.

Box (A) is placed on the ground, while box (B) is placed at a height of 2 m above the ground. To what height must box (A) be raised so that it has the same gravitational potential energy as box (B)?



14) A ladder of length **6 m** rests against a vertical wall, making an angle of **30°** with the ground. A man of mass **70 kg** climbs the ladder. Calculate the **work done** by the man to reach the top of the ladder, the **gravitational potential energy** of the man at the top of the ladder and **what** do you deduce from your results?

- The end -





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Chapter 1 | Energy

Group (A)

First: Multiple Choice Questions

1) A body has a kinetic energy of **4 J**. What will its kinetic energy be if its speed is doubled?

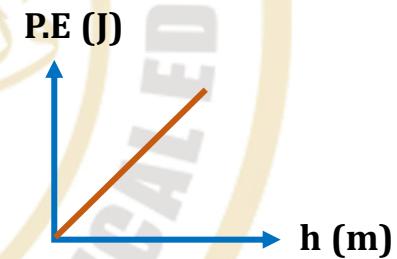
- (A) **0.8 J**
- (B) **4 J**
- (C) **16 J**
- (D) **8 J**

2) The slope of the straight line in the opposite graph represents the

- (A) **mass of the body**
- (B) **weight of the body**
- (C) **displacement of the body**
- (D) **velocity of the body**

3) If a body is projected vertically upward, which of the following physical quantities becomes **zero** at the maximum height?

- (A) **its weight**
- (B) **its acceleration**
- (C) **its potential energy**
- (D) **its velocity**

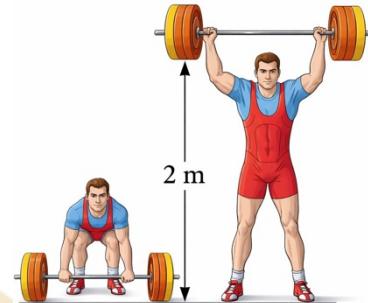




4) The opposite figure shows a weightlifter lifting a mass of **100 kg**. The work done by the weightlifter to raise the mass from the ground to a height of **2 m** is

(Given that: $g = 10 \text{ m/s}^2$)

- (A) **100 J**
- (B) **200 J**
- (C) **1000 J**
- (D) **2000 J**



Second: Essay Questions

5) Calculate the work done to lift a body of mass **50 kg** through a height of **2.2 m** above the ground surface.

Group (B)

First: Multiple Choice Questions

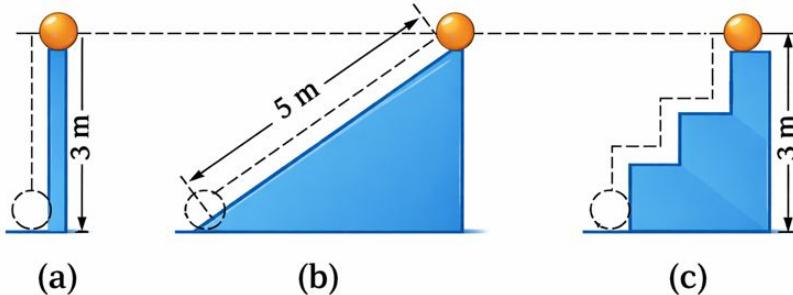
1) A body of mass **m** is located near the Earth's surface. If its gravitational potential energy at a point **5 m** above the ground is **980 J**, and the acceleration due to gravity is $g = 9.8 \text{ m/s}^2$, what is the mass of the body?

- (A) **20 kg**
- (B) **50 kg**
- (C) **100 kg**
- (D) **196 kg**



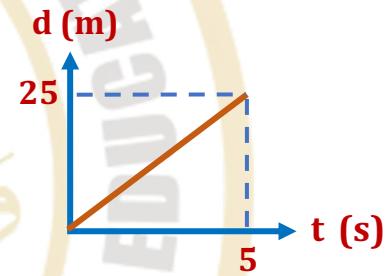
2) The opposite figures show three different frictionless paths that a stationary ball at ground level can follow to reach a certain height. Along which path is the work done in lifting the ball the greatest?

- (A) Path (a)
- (B) Path (b)
- (C) Path (c)
- (D) Equal in all three paths



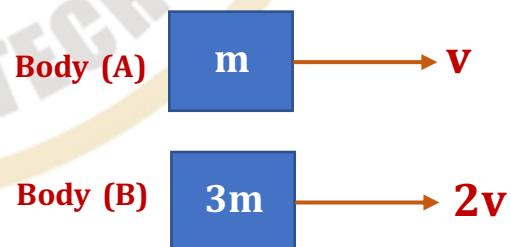
3) The opposite graph shows a displacement-time curve for the motion of a body of mass 20 kg. The kinetic energy of this body is equal to

- (A) 25 J
- (B) 50 J
- (C) 125 J
- (D) 250 J



4) The opposite figure shows two bodies (A) and (B) of masses m and $3m$, moving with uniform speeds v and $2v$, respectively. If the kinetic energy of body (A) is $K.E$, then the kinetic energy of body (B) is

- (A) 2 K.E
- (B) 4 K.E
- (C) 6 K.E
- (D) 12 K.E





Second: Essay Questions

5) The opposite figure shows a table raised **0.5 m** above the ground surface, on which a book of mass **2 kg** is placed. Calculate its gravitational potential energy.
(Given that: $g = 9.8 \text{ m/s}^2$)



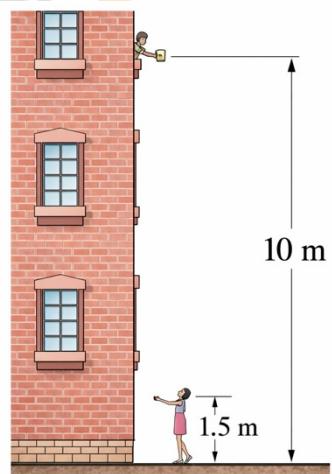
Group (C)

First: Multiple Choice Questions

1) In the opposite figure, a person drops a body of mass **0.2 kg** from a height of **10 m** above the ground surface, and another person catches it with his hands at a height of **1.5 m** above the ground. The decrease in the gravitational potential energy of the body is equal to

(Given that: $g = 10 \text{ m/s}^2$)

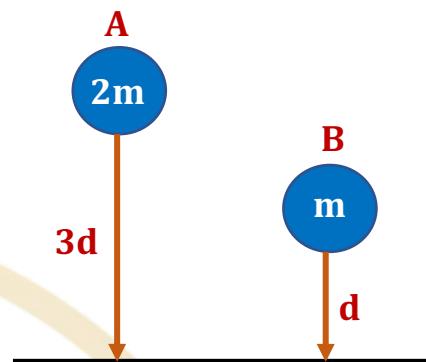
- (A) **8.5 J**
- (B) **10 J**
- (C) **17 J**
- (D) **20 J**





2) Two bodies (A) and (B) fall freely toward the ground surface from the heights shown in the figure. The ratio of their kinetic energies at the moment they strike the ground, $(KE)_A/(KE)_B$, is equal to

- (A) 1/3
- (B) 3/1
- (C) 1/6
- (D) 6/1



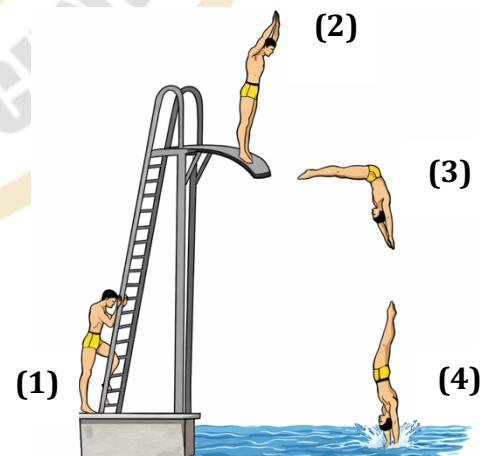
3) A stone is projected vertically upward from the ground surface with a certain velocity and reaches a height of 12 m. If the same stone is projected upward with the same velocity on the surface of the Moon, the height it reaches is

(Given that the acceleration due to gravity on the Moon is $1/6$ of that on Earth)

- (A) 2 m
- (B) 12 m
- (C) 28 m
- (D) 72 m

4) In the opposite figure, which of the following statements is correct?

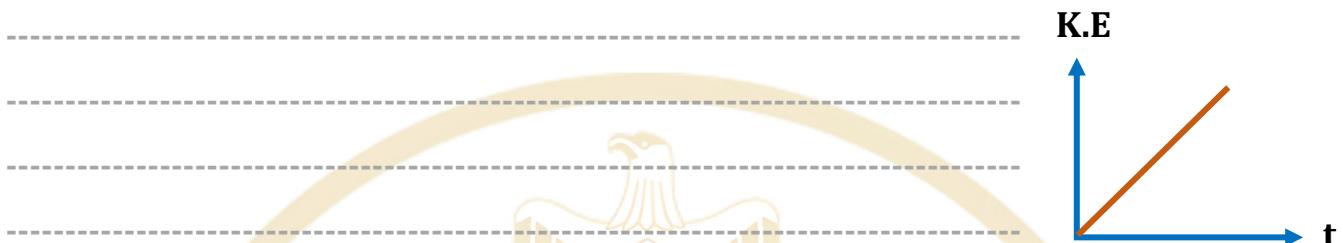
- (A) The potential energy at point (1) is greater than the potential energy at point (2)
- (B) The kinetic energy at point (4) is less than the kinetic energy at point (3)
- (C) The speed at point (3) is equal to zero
- (D) The potential energy decreases gradually as the man moves from position (2) to position (4)





Second: Essay Questions

5) The opposite graph represents the variation of the kinetic energy of a body of mass m with time. Does the body move with uniform speed or variable speed? Why?



- The end -

