

Central Administration for Curriculum Development

Science development office



Physics

Second Secondary Grade

20
26

Home Work

Week

1

Name:

Class:

School:

إعداد

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مراجعة

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مكتب مستشار العلوم

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إشراف

د/ عزيزة رجب خليفة
مستشار العلوم

إشراف عام

د/ هالة عبد السلام
رئيس الإدارة المركزية للتعليم العام



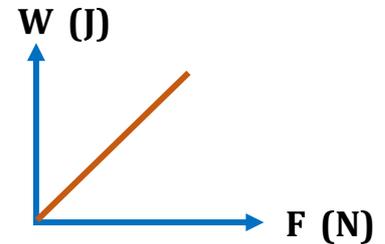
First: Multiple Choice Questions

- 1) If the force acting on a body is **doubled** while it moves through the same displacement, the work done
- (A) increases to four times its value
 - (B) increases to double its value
 - (C) decreases to half its value
 - (D) remains constant
- 2) The work done by the braking force is
- (A) positive
 - (B) negative
 - (C) equal to zero
 - (D) depends on the direction of motion relative to the force
- 3) When a body moves in a direction that makes an angle of 60° with the direction of the applied force, the work done is equal to
- (A) zero
 - (B) maximum value
 - (C) half the maximum value
 - (D) less than the maximum value and greater than zero

- 4) The figure represents the graphical relationship between the work done (W) and the applied force (F) in the direction of displacement.

The slope of the graph represents

- (A) the work done
- (B) the applied force
- (C) the displacement of the body
- (D) the time taken to do the work

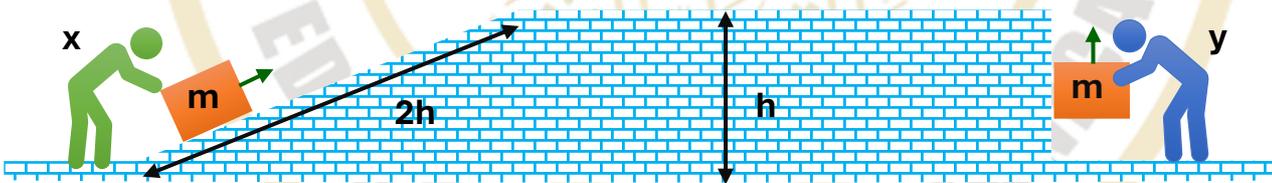


- 5) The type of work done by the tension force exerted by a person pulling a suitcase behind him as shown in the figure is

- (A) positive work
- (B) negative work
- (C) zero
- (D) depends on the speed of motion



- 6) Both x and y wanted to place a mass of m kg onto a platform at a height h m above the ground.



y lifted the mass vertically and placed it on the platform, while x used an inclined plane of length $2h$ and pushed the mass upward along it. In this case,

- (A) the work done by x is greater than the work done by y .
- (B) the work done by y is greater than the work done by x .
- (C) the work done in both cases is equal, but the force of x is greater than y .
- (D) the work done in both cases is equal, but the force of y is greater than x .

7) The work required to push a cart through a distance of **3.5m** by a force of **20 N** acting in the same direction as the motion is equal to

- (A) 7 J
- (B) 20 J
- (C) 70 J
- (D) 140 J

8) If a force **F** acts on a body and displaces it from point **(A)** to point **(B)** through a distance of **2 m** in the same direction as the force, then the work done is **$W = 2F$** .

This is because



- (A) the magnitude of the applied force is equal to twice the displacement
- (B) work is directly proportional only to the magnitude of the force
- (C) the direction of the force makes an angle of 60° with the direction of displacement
- (D) the displacement is 2m and the force acts in the same direction as the displacement

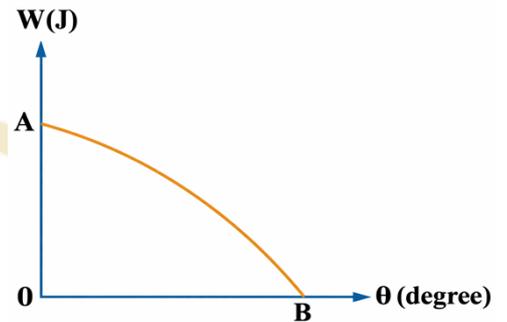
9) A force of **100N** acts on a body producing a displacement of **2.5m**.

If the force is perpendicular to the direction of motion of the body, the work done is ...

- (A) 250 J
- (B) 125 J
- (C) 50 J
- (D) 0 J

10) A force of magnitude **100 N** acts on a body repeatedly, producing a displacement of **5 m** each time, while the angle (θ) between the directions of the force and the displacement is varied. The opposite graph represents the relationship between the work (**W**) done on the body by this force and the angle (θ). The value of the angle at point (**B**) is

- (A) 30°
- (B) 45°
- (C) 60°
- (D) 90°



11) A motorcycle of mass **200kg** moves along a straight line. If the engine force acting on it is **500N**, and the frictional force is **100N** for each **100kg** of its mass, the work done on the motorcycle when it travels a distance of **50m** is

- (A) 10000 J
- (B) 15000 J
- (C) 25000 J
- (D) 30000 J

12) A mother pushes her baby's stroller at constant speed along a straight horizontal road with a force making an angle of **60°** with the horizontal. If the stroller is subjected to a frictional force of **20N**, the work done by the mother on the stroller to move it through a distance of **5m** is

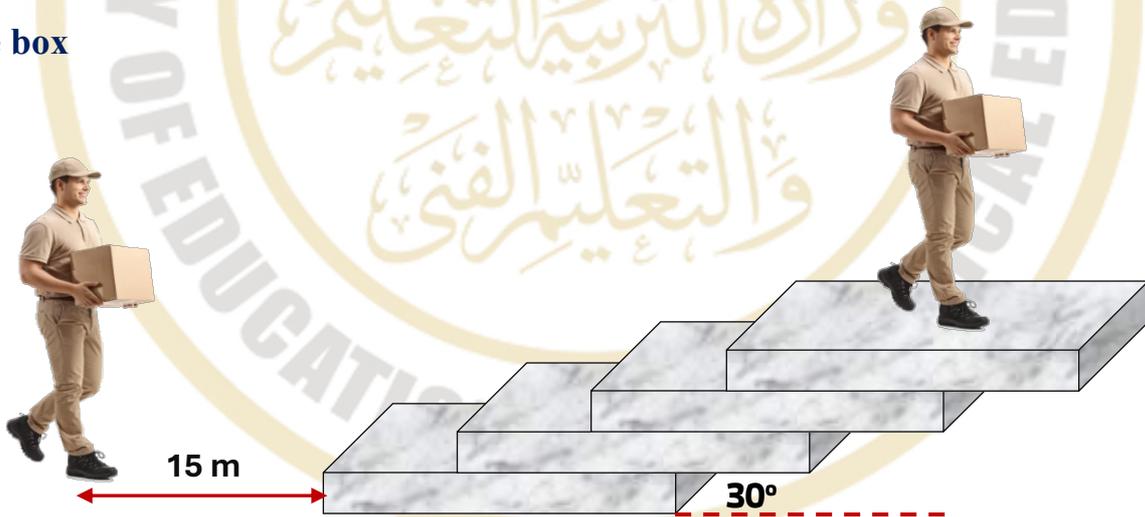
- (A) 50 J
- (B) 80 J
- (C) 100 J
- (D) 200 J



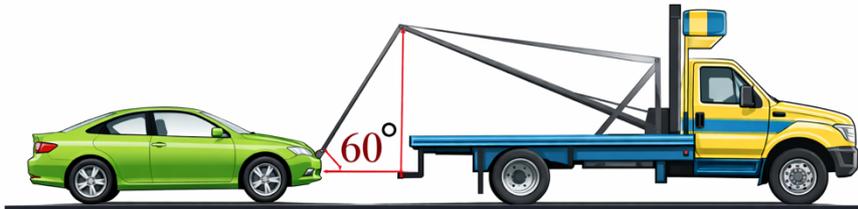
Second: Essay Questions

13) A student stated that work is a vector quantity because the vector (cross) product of two vector quantities, force and displacement, results in a vector quantity. Identify the error in this statement and state the correct concept.

14) A worker carries a box of mass **40kg**. He moves a horizontal distance of **15m**, then climbs a ladder of length **20m** inclined at an angle of **30°** to the horizontal, as shown in the figure. If the acceleration due to gravity is **10m s⁻²**, calculate the work done by the weight of the box



- 15) Winch pulls an illegally parked car along a horizontal road through a displacement of **1 km** using a rope, as shown in the figure. The work done on the car by the tension force in the rope is $2.5 \times 10^5 \text{ J}$. Calculate the tension in the rope.



- The end -



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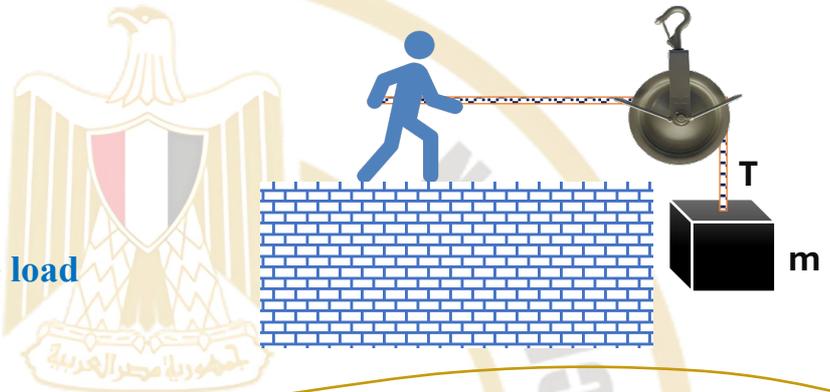
Chapter 1 | Work

Group (A)

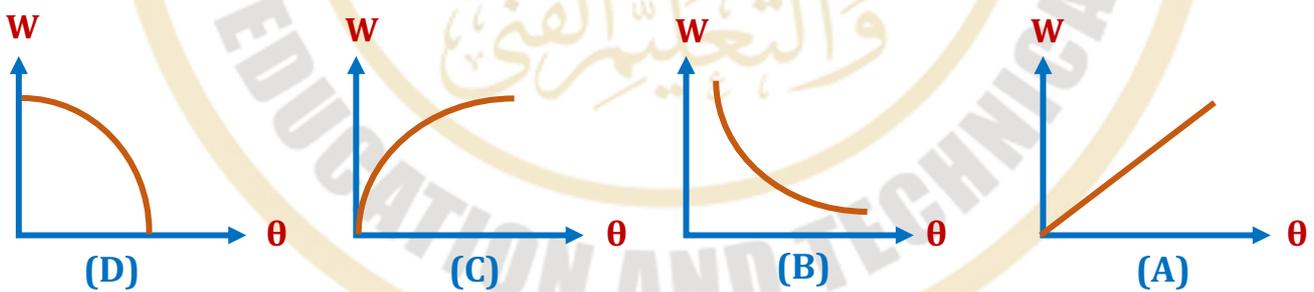
First: Multiple Choice Questions

1) In the shown figure, the work done by the force exerted by the person to lift a load upward using a pulley is

- (A) positive work
- (B) negative work
- (C) equal to zero
- (D) depends on the weight of the load



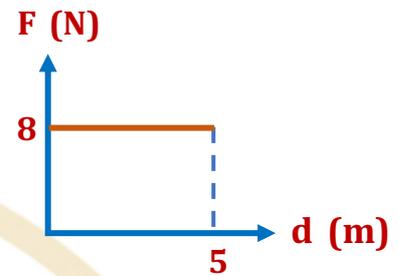
2) Which of the following graphs represents the relationship between the work done (W) on a body by a constant force acting on it and the angle (θ) between the directions of this force and the displacement of the body, assuming the displacement is constant?



- 3) The adjacent graph shows the relationship between the horizontal force F acting on a body and the horizontal displacement d produced by this force.

The work done on the body when the displacement is 5m is

- (A) 20 J
 (B) 30 J
 (C) 40 J
 (D) 50 J



- 4) Two horizontal forces act on a body placed on a smooth horizontal surface: a force of 9N to the right and a force of 3N to the left.

If these forces cause the body to move horizontally through a distance of 2m , the work done by the resultant force on the body is

- (A) 6 J
 (B) 9 J
 (C) 12 J
 (D) 18 J



Second: Essay Questions

- 5) Calculate the work done by the weight of a girl carrying a bucket of mass 300g while moving with it through a horizontal displacement of 10m .

Then calculate the work done by the weight of a child to lift a bucket of the same mass through a vertical displacement of 10 cm . (Knowing that $g = 10\text{ m/s}^2$)

.....

Group (B)

First: Multiple Choice Questions

- 1) A man pushes a wall but fails to move it. The work done by the man is
 - (A) negative work
 - (B) positive but not maximum work
 - (C) no work is done at all
 - (D) maximum work

- 2) A rigid body moves a distance of **10m** along a straight line under the action of a force of **5N**.
 If the work done by this force on the body is **25J**, the angle between the force and the direction of motion of the body is
 - (A) 0°
 - (B) 30°
 - (C) 60°
 - (D) 90°

- 3) In the shown figure, a man of mass **70kg** walks along a horizontal pavement for a distance of **10m**. The work done by the man's weight on the pavement is
 (Knowing that: $g = 10 \text{ m s}^{-2}$)
 - (A) 7000 J
 - (B) 3500 J
 - (C) 700 J
 - (D) 0 J

