



PHYSICS

AAKASH INSTITUTE ENGLISH

MOCK TEST 8

Example

1. The magnitude of two vectors are 16 and 12 units respectively and the magnitude of their

scalar product is $98\sqrt{2}$ units. The angle between the vectors would be

A. 30°

B. 45°

C. 60°

D. 90°

Answer: B



Watch Video Solution

2. If $\vec{A} = (2\hat{i} + 3\hat{j} + 5\hat{k})$ and $\vec{B} = (\hat{i} + 6\hat{j} + 6\hat{k})$, then projection of \vec{A} on \vec{B} would be

A. $\frac{50}{\sqrt{73}}$

B. $\frac{10}{\sqrt{73}}$

C. $\frac{40}{\sqrt{73}}$

D. zero

Answer: A



Watch Video Solution

3. A stone of mass 20 g falling from height of 2 km hits the ground with a speed of 200m.s^{-1} .

The work done by the gravitational force is

A. 100J

B. 200J

C. 300J

D. 400J

Answer: D



Watch Video Solution

4. The gravitational unit of what(kg-m) equal to

A. 9.8Newton

B. 9.8Joule

C. 10^7 Joule

D. 10^7 Newton

Answer: B



Watch Video Solution

5. A block is pushed through 2m across a surface offering 25 N resistance. The work done by the resisting force

A. 50J

B. 25J

C. - 50J

D. - 25J

Answer: C



Watch Video Solution

6. A force $f = 10 + 2x$ acts on a particle moving in straight line on x axis the work done by this force during a displacement from $x = 0$ and $x = 3m$

A. 13J

B. 29J

C. 39J

D. 43J

Answer: C



Watch Video Solution

7. The vectors $\vec{A} = \sin(\alpha t)\hat{i} - \cos(\alpha t)\hat{j}$ and $\vec{B} = \cos\left(\alpha\frac{t^2}{4}\right)\hat{i} + \sin\left(\alpha\frac{t^2}{4}\right)\hat{j}$ are orthogonal to each other the value of t would be (where α is a positive constant)

A. t=2

B. t=4

C. t=6

D. t=8

Answer: B



Watch Video Solution

8. A uniform force of $(5\hat{i} + 5\hat{j})N$ acts on particle of mass 1 kg. The particle moves from $r_1 = (3\hat{i} + 4\hat{j})m$ to $r_2 = (5\hat{i} + 8\hat{j})m$ under this force. The work done by this force is

A. 20J

B. 25J

C. 30J

D. 50J

Answer: C



Watch Video Solution

9. The velocity of a particle of mass 1 kg is given by $v = 10\sqrt{x}$ the work done by the force acting on the particle during its motion from $x = 4$ to $x = 9m$ is

A. 250J

B. 300J

C. 350J

D. 400J

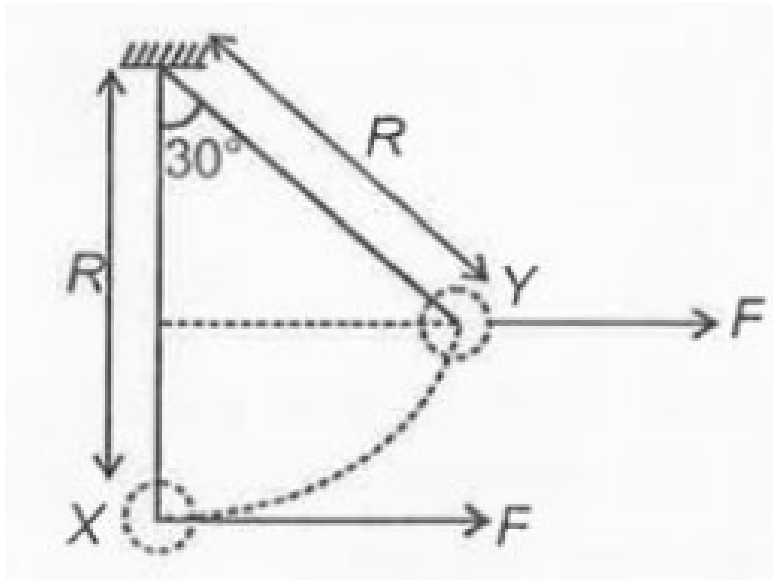
Answer: A



Watch Video Solution

10. A block of mass 2 kg is pulled along circular arc from position X to Y as shown in figure. The work done by the horizontal force is

pulling the block from X to Y is



A. $FR\sin 30^\circ$

B. $FR\cos 30^\circ$

C. $FR\tan 30^\circ$

D. $FR\cot 30^\circ$

Answer: A



Watch Video Solution

11. Two bodies of mass $1kg$ and $2kg$ have equal momentum. The ratio of their kinetic energies is:

A. 1:3

B. 3:1

C. 2:1

D. 4:1

Answer: C



Watch Video Solution

12. A bullet of mass 50 g enters a block of thickness t with speed of 500 ms^{-1} . It emerges with 4% of its initial kinetic energy.

The emergent speed is

A. 100 ms^{-1}

B. 200 ms^{-1}

C. 300 ms^{-1}

D. 500ms^{-1}

Answer: A



Watch Video Solution

13. 1 electron volt is equal to

A. $3.2 \cdot 10^{-12}\text{J}$

B. $1.6 \cdot 10^{-16}\text{J}$

C. $1.6 \cdot 10^{-19}\text{J}$

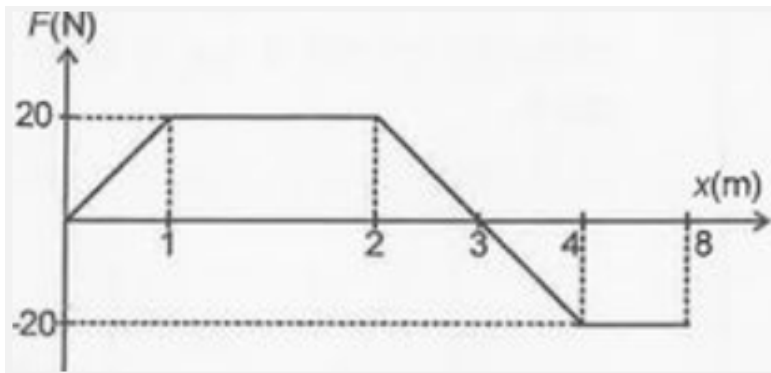
D. $4.6 \cdot 10^{-20}\text{J}$

Answer: C



Watch Video Solution

14. A position dependent force F acting on a particle and its force-position curve is shown in the figure. The work done by force from $x = 1 \text{ m}$ to $x = 4 \text{ m}$ is



A. 35J

B. -20J

C. -15J

D. 20J

Answer: D



Watch Video Solution

15. When a body is thrown up , work done by gravity on the body is

A. zero

B. negative

C. positive

D. can be negative or positive

Answer: B



Watch Video Solution

16. A force of 10 N holds an ideal spring with a $20 \frac{N}{m}$ spring constant in compression. The potential energy stored in the spring is

A. 0.5J

B. 2.5J

C. 5J

D. 10 J

Answer: B



Watch Video Solution

17. A small stone of mass 0.4 kg tied to a massless inextensible string is made to loop the loop. Radius of the path is 4 m. Find its

speed at the highest point. How would this speed change if mass of the stone is decreased by 10 % ? ($g = 10ms^{-2}$).

A. 6.32m/s

B. zero

C. 5m/s

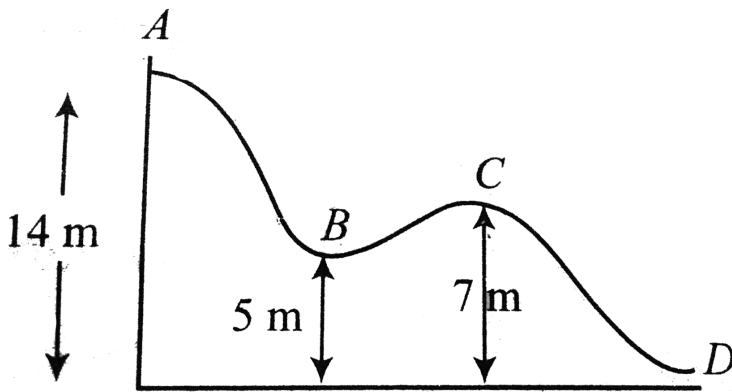
D. 3m/s

Answer: A



Watch Video Solution

18. Figure shows the vertical section of a frictionless surface. A block of mass 2kg is released from rest from position A, its KE as it reaches position C is ($g = 10\text{ms}^{-2}$)



A. 108J

B. 40J

C. 140J

D. 280J

Answer: C



Watch Video Solution

19. The potential energy of a weight less spring compressed by a distance a is proportional to

A. a

B. a^2

C. a^{-2}

D. a^0

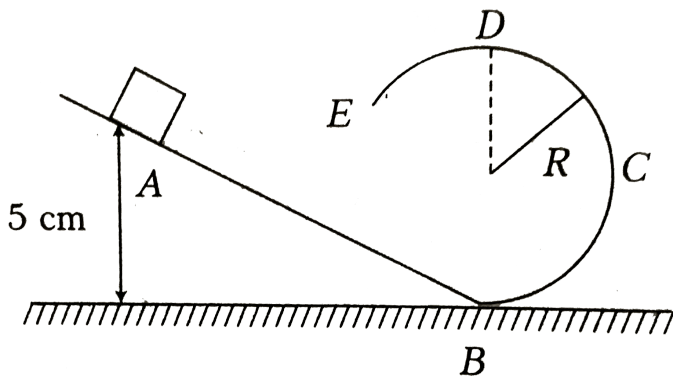
Answer: B



Watch Video Solution

20. A frictionless track ABCDE ends in a circular loop of radius R . A body slides down the track from point A which is at height $h = 5\text{cm}$. Maximum value of R for a body to complete

the loop successfully is



A. 5cm

B. $\frac{15}{4}$ cm

C. $\frac{10}{3}$ cm

D. 2cm

Answer: D



Watch Video Solution

21. A particle is rotated in a vertical circle by connecting it to the end of massless rod of length l and keeping the other end of rod fixed. The minimum speed of the particle when the rod is horizontal for which the particle will complete the circle is

A. \sqrt{gl}

B. $\sqrt{2gl}$

C. $\sqrt{3gl}$

D. $\sqrt{5gl}$

Answer: C



Watch Video Solution

22. If two persons A and B take 2 seconds and 4 seconds respectively to lift an object to the same height h , then the ratio of their potential energies at highest point is

A. 1 : 2

B. 1 : 1

C. 2 : 1

D. 1 : 3

Answer: B



Watch Video Solution

23. A small stone of mass 50 g is rotated in a vertical circle of radius 40 cm. What is the minimum tension in the string at the lowest point?

A. 6N

B. 2N

C. 3N

D. 1.5N

Answer: C



Watch Video Solution

24. a block of mass 0.1 kg attached to a spring of spring constant $400 \frac{N}{m}$ pulled horizontally

from $x = 0$ to $x_1 = 10\text{mm}$. Find the work done
by the spring force

A. $2 \cdot 10^{-2}\text{J}$

B. $2 \cdot 10^{-6}\text{J}$

C. $3 \cdot 10^{-6}\text{J}$

D. $4 \cdot 10^{-2}\text{J}$

Answer: A



Watch Video Solution

25. Assertion:- A body may gain kinetic energy and potential energy simultaneously.

Reason:- Conservation of mechanical energy may not be valid every time.

A. Only when no external force acts on the system

B. Only when the objects move along closed path

C. Only when the work done by the resultant external force is zero

D. Only when the objects move under the action of a conservative force

Answer: D



Watch Video Solution

26. Potential energy of a particle at position x is given by $U = (x^2 - 4x)J$. Which of the following is equilibrium position of the particle?

A. $x=0$

B. $x=5\text{m}$

C. $x=2\text{m}$

D. $x=4\text{m}$

Answer: C



Watch Video Solution

27. Two springs A and B ($k_A = 2k_B$) are stretched by applying forces of equal

magnitudes at the force ends. If the energy stored in A is E , that in B is

A. $\frac{E}{2}$

B. $2E$

C. E

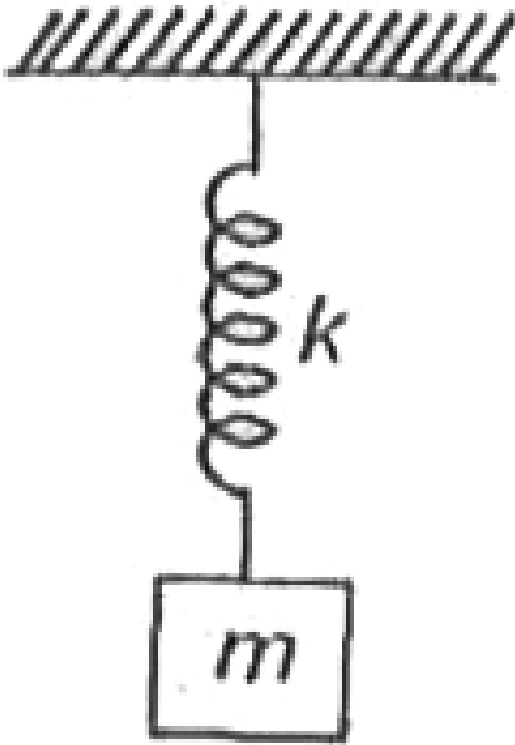
D. $\frac{E}{4}$

Answer: B



Watch Video Solution

28. Initially mass m is held such that spring is in relaxed condition. If mass m is suddenly released, maximum elongation in spring will be



A. $m \frac{g}{k}$

B. $2m \frac{g}{k}$

C. $m \frac{g}{2} k$

D. $m \frac{g}{4} k$

Answer: A



Watch Video Solution

29. A stone projected vertically upwards from the ground reaches a maximum height h .

When it is at a height $(3h) / (4)$, the ratio of its kinetic and potential energies is

A. 3 : 1

B. 1 : 1

C. 1 : 3

D. 1 : 2

Answer: C



Watch Video Solution

30. Work done by a spring force is

A. Always negative

B. Always positive

C. Always zero

D. May be positive, negative or zero

Answer: D



Watch Video Solution