

CU-ATS Physics

Nov 2025

Question Style

**30 questions
60 minutes**

CU-ATS Physics

>> Nov 2025 Exam Style <<
(30 questions, 60 minutes)

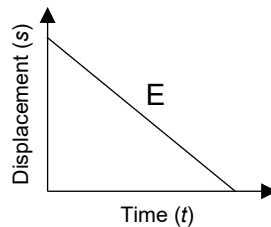
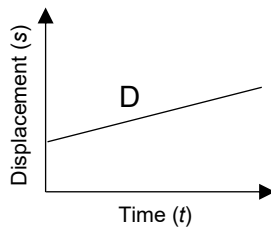
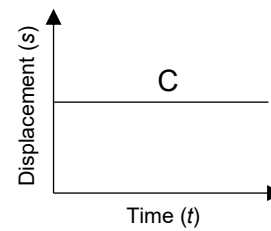
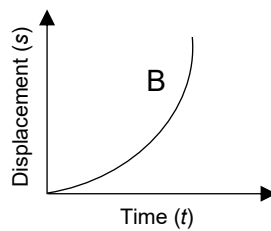
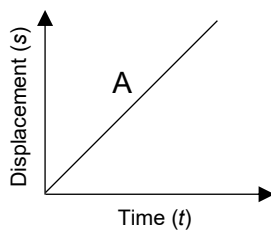
1.

An object is released from rest from a height H above the ground. Assuming air resistance is negligible and the acceleration due to gravity is g , which of the following expressions correctly represents the velocity v of the object immediately before it strikes the ground?

- A. $\sqrt{\frac{2H}{g}}$ directed downwards
- B. \sqrt{gH} directed downwards
- C. $\sqrt{2gH}$ directed downwards
- D. $\sqrt{2gH}$ directed upwards
- E. $2gH$ directed downwards

2.

Which of the following displacement-time (s-t) graphs best represents the motion of an object that remains stationary?



3.

A particle is moving with an initial velocity of 24 m/s. It decelerates uniformly to a final velocity of 6 m/s over a period of 9.0 s. What is the total distance covered by the particle during this time?

- A. 54 m
- B. 135 m
- C. 180 m
- D. 216 m
- E. 270 m

4.

A 2.0-kg mass is hung vertically from a spring with a spring constant of 400 N/m. Assuming the system reaches equilibrium and the acceleration due to gravity $g = 10 \text{ m/s}^2$, what is the elastic potential energy stored in the spring-mass system?

- A. 0.05 J
- B. 0.50 J
- C. 1.00 J
- D. 5.00 J
- E. 10.0 J

5.

An object is released from rest at the top of a frictionless inclined plane. As the object slides down the plane, which of the following statements correctly describes the total mechanical energy of the system?

- A. It remains constant.
- B. It increases because the speed of the object increases.
- C. It decreases because the height of the object decreases.
- D. It depends on the mass of the object.
- E. It depends on the angle of inclination

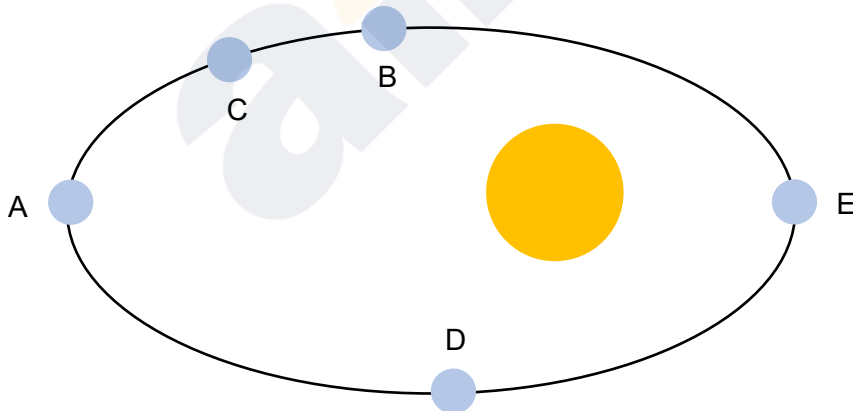
6.

A projectile is launched with an initial speed u at an angle θ to the horizontal. Neglecting air resistance, what is the ratio of the kinetic energy of the projectile at its maximum height to its initial kinetic energy?

- A. 1
- B. $\sin^2\theta$
- C. $\cos\theta$
- D. $\cos^2\theta$
- E. $\tan^2\theta$

7.

A planet moves in an elliptical orbit around a star located at one of the foci. The angular momentum of the planet is defined as $\mathbf{L} = \mathbf{r} \times \mathbf{p}$, where \mathbf{r} is the position vector and \mathbf{p} is the linear momentum. Based on the conservation of angular momentum, at which position in the orbit does the planet have its **maximum speed**?



8.

An object of volume V and density ρ falls vertically through a fluid of density ρ_L . The buoyant force is given by $FB = \rho_L Vg$. The viscous drag force is given by $Fd = f(r)v$, where v is the speed and $f(r)$ is a coefficient depending on the radius. What is the terminal velocity of the object?

A. $\frac{Vg(\rho + \rho_L)}{f(r)}$

B. $\frac{Vg(\rho_L - \rho)}{f(r)}$

C. $\frac{f(r)}{Vg(\rho - \rho_L)}$

D. $\frac{Vg(\rho - \rho_L)}{f(r)}$

E. $\frac{V(\rho - \rho_L)}{gf(r)}$

9.

A block is attached to a light spring and placed on a rough inclined plane with a coefficient of static friction $\mu = 1.0$. The setup undergoes two stages: **Stage 1**: At an initial inclination angle θ_0 , the block is in equilibrium, but the spring is extended by a distance $+x$. **Stage 2**: The angle is decreased to a new value θ_1 (where $\theta_1 < \theta_0$).

Consider the following set of possible angles for θ_1 : $\{35^\circ, 40^\circ, 45^\circ, 50^\circ, 55^\circ, 60^\circ, 65^\circ\}$

How many angles in this set allow the block to remain in equilibrium with the spring in its **unextended (relaxed)** state?

A. 2

B. 3

C. 4

D. 5

E. 6

10.

Newton's Law of Universal Gravitation states that the gravitational force between two masses is given by $\mathbf{F} = \mathbf{G}(m_1m_2)/r^2$. Consider an object of mass m . Let M_E and R_E be the mass and radius of the Earth, and M_M and R_M be the mass and radius of the Moon. Which of the following expressions represents the ratio of the object's weight on Earth to its weight on the Moon?

A. $\frac{M_E R_M^2}{M_M R_E^2}$

B. $\frac{M_E R_E^2}{M_M R_M^2}$

C. $\frac{M_M R_E^2}{M_E R_M^2}$

D. $\frac{M_M R_M}{M_E R_E}$

E. $\frac{M_E R_E}{M_M R_M}$

11.

A light rope is wound around a solid cylinder of radius R . A block of mass m is attached to the free end of the rope. The block is released from rest and falls with downward acceleration a . What is the magnitude of the torque τ exerted on the cylinder by the rope?

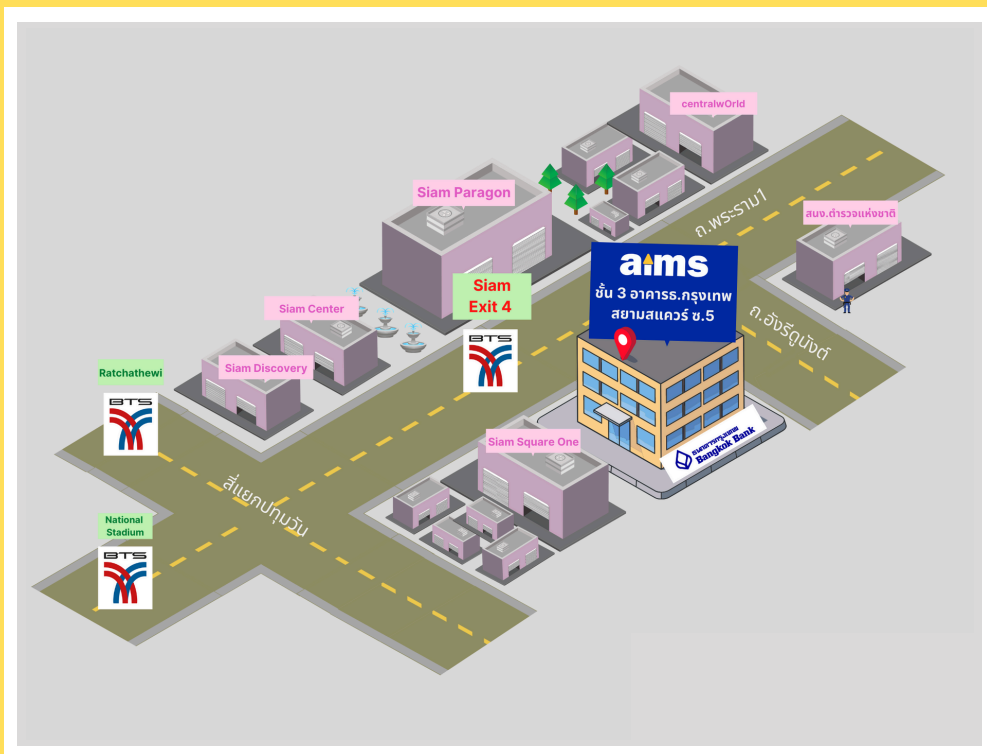
A. $m(g + a)R$

B. $m(g - a)R$

C. mgR

D. maR

E. $\frac{m(g-a)}{R}$




aims Siam Square


BTS Siam Exit 4 (opposite to Siam Paragon)
3rd Fl., Bangkok Bank Building (Siam Square Soi 5)
Rama 1 Rd., Pathumwan, Bangkok




LINE @aims2

 aims.school

 aims_school

 aims_school

 02-254-9300
02-658-4253, 02-658-4254