QUIZ CUBES

Class 11/12 | AP Physics | IIT JEE | NEET

PHYSICS
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1. Comparing a sports car and a truck, which factor more significantly impacts their kinetic energies?

A. Their weights

B. Their speeds

C. Both equally

D. The type of fuel they use

2. If a watermelon and a grape have the same velocity, how does doubling the mass of the grape affect its kinetic energy?

A. It doubles

B. It quadruples

C. It remains the same

D. It halves

3. When a skateboarder increases their speed from 5 m/s to 10 m/s, how is their kinetic energy affected?

A. Doubles

B. Quadruples

C. Halves

D. Remains the same

4. Why might a small drone have more kinetic energy than a slowly moving car?

A. Greater mass

B. Higher velocity

C. Smaller size

D. Type of battery used

5. When a rocket engine accelerates a spacecraft, how is the kinetic energy of the spacecraft affected?

A. It decreases

B. It's unrelated

C. It can increase or decrease

D. It always increases

6. What kind of work is done when brakes are applied to slow down a bicycle?

A. Positive work

B. Negative work

C. No work

D. Mechanical work

7. In the context of energy, how is charging a phone battery similar to electronic money transfer?

A. Physical entities are transferred

B. It involves a material exchange

C. It's a change in numerical values

D. It's not similar to money transfer

8. When analyzing the motion of a falling apple, which equation is used to describe the force acting on it?

A. $F = ma$

B. $F = mv$

C. $W = Fd$

D. $KE = ½ mv^2$

9. How does the kinetic energy of a rolling ball change if it accelerates down a slope?

A. Increases proportionally to its velocity

B. Decreases proportionally to its velocity

C. Depends on the ball's mass

D. Changes as per the square of the velocity change

10. What is true about the work done by a railway engine on the rest of the train?

A. It's always positive

B. It depends on the displacement and force direction of the Engine

C. It's unrelated to displacement

D. It's a vector quantity

Answers UnCubed

1. B. Their speeds

Kinetic energy is more influenced by speed (velocity) because it is squared in the kinetic energy formula. Therefore, the sports car's speed could lead to greater kinetic energy than the truck's weight.

2. A. It doubles

Kinetic energy is directly proportional to mass. Doubling the grape's mass, while keeping velocity constant, doubles its kinetic energy, similar to how a watermelon's mass affects its kinetic energy.

3. B. Quadruples

The skateboarder's kinetic energy quadruples because kinetic energy is proportional to the square of the velocity. Thus, a speed increase from 5 m/s to 10 m/s greatly increases the energy.

4. B. Higher velocity

Despite its small size, a drone can have more kinetic energy than a slow-moving car due to its high velocity, illustrating the greater impact of velocity over mass in the kinetic energy equation.

5. C. It can increase or decrease

A rocket engine can either increase or decrease speed (remember in physics, acceleration does not necessarily mean increase in speed), affecting its kinetic energy accordingly.

6. B. Negative work

Applying brakes to a bicycle does negative work by reducing its kinetic energy through deceleration, similar to any force that slows down an object.

7. C. It's a change in numerical values

Charging a phone battery is like electronic money transfer; it's about changing energy values (battery charge level) without physical material transfer, just as numbers change in accounts.

8. A. F = ma

Newton's second law, F = ma, applies to the falling apple, where 'F' is the force due to gravity, 'm' is the mass of the apple, and 'a' is the acceleration due to gravity.

9. D. Changes as per the square of the velocity change

As the ball rolls down and accelerates, its kinetic energy changes according to the square of its velocity change, demonstrating the direct relationship between velocity and kinetic energy.

10. B. It depends on the displacement and force direction of the Engine

The work done by a railway engine on the train depends on the displacement (distance moved) and the direction of the force applied by the engine, illustrating how work is influenced by both displacement and force direction.