

J.K. PUBLIC SCHOOL, KUNJWANI

Holidays Homework

Class: 9th

Subject : Physics

Q.1 Multiple choice questions:

- A particle is moving in a circular path of radius 'r'. The displacement after half a circle would be:
(a) zero (b) πr (c) $2r$ (d) $2\pi r$
- A body is thrown vertically upwards with velocity 'u', the greater height 'h' to which it will rise is:
(a) u/g (b) $u^2/2g$ (c) u^2/g (d) $u/2g$
- Which of the following statement is not correct for an object moving along a straight path in an accelerated motion?
(a) Its speed keeps changing (b) its velocity always changes
(c) It always goes away from earth (d) a force is always acting on it
- A passenger in a moving train tosses a coin which falls behind him. It means that motion of the train is:
(a) accelerated (b) uniform (c) retarded (d) along circular track
- 'Rocket' works on the principle of conservation of:
(a) mass (b) energy (c) momentum (d) velocity
- An object of mass 2kg is sliding with a constant velocity of 4ms^{-1} on a frictionless horizontal table. The force required to keep the object moving with the same velocity is:
(a) 32N (b) 0N (c) 2N (d) 8N
- Area under a V-t graph represents a physical quantity which has the unit:
(a) m^2 (b) m (c) m^3 (d) ms^{-1}
- Suppose a boy is enjoying a ride on a merry go round which is moving with a constant speed of 10m^{-1} . It implies that the boy is:
(a) at rest (b) moving with no acceleration
(c) in acceleration motion (d) moving with uniform velocity
- A water tanker filled up to $2/3$ of its height is moving with a uniform speed. On sudden application of the brake the water in the tank would:
(a) move backward (b) move forward (c) be unaffected (d) rise upwards
- A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. This enables the goal keeper to:
(a) exert large force on the ball (b) increase the rate of change of momentum.
(c) decrease the rate of change of momentum (d) reduce the force exerted by the ball on hands

Q.2 Numerical aptitude.

1. A motorcyclist drives from A to B with a uniform speed of 30 kmh^{-1} and returns back with a speed of 20 kmh^{-1} . Find its average speed.
2. An electron moving with a velocity of $5 \times 10^4 \text{ ms}^{-1}$ enters into a uniform electric field and acquires a uniform acceleration of 10^4 ms^{-2} in the direction of its initial motion.
 - (a) Calculate the time in which the electrons would acquire a velocity double of its initial velocity.
 - (b) How much distance the electron would cover in this time?
3. Using 2nd law of motion, derive the relation between force and acceleration. A bullet of 10g strikes a sand bag at a speed of 10^3 ms^{-1} and gets embedded after travelling 5 cm . Calculate :
 - (a) the resistive force exerted by the sand on the bullet.
 - (b) the time taken by the bullet to come to rest.
4. A truck of mass 'M' is moved under a force 'F'. If the truck is then loaded with an object equal to the mass of the truck and the driving force is halved, then how does the acceleration change?
5. An object starting from rest travels 20m in first 2 seconds and 160m in next 4 seconds, what will be the velocity after 7 seconds from the start?

Q.3 Reasoning based questions.

1. A horse continues to apply a force in order to move a cart with a constant speed, explain why?
2. Two identical bullets are fired one by a long rifle and another by a heavy rifle with the same force. Which rifle will hurt the shoulder more and why?
3. How motion and rest are relative terms?
4. Why time is independent variable?
5. Give six applications of Newton's 3rd law of motion.
6. What kind of force is required to move a rest body, balanced or un-balanced, give reasons?

Q.4 HOTS (High Order Thinking Skill).

1. Two carts at a constant speed are moving parallel to each other in a same direction, a person standing on 1st cart jumps on the 2nd cart. Will he experience the 'Inertia of motion'? Give reason.
2. 'Gravitational Force' of the Earth hold all the bodies i.e., object like humans, animals, aeroplane, train, etc. to the Earth then why the jam spreaded on the bread do not fall when tilted downward?
3. Between Gravitational Force and Electromagnetic Force, which is stronger? and why? give reason.

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