VGR COACHING CENTER

CLASS-XI   **PHYSICS**   **MARK-70**

PART-A   10×1=10

1. Force acting on the particle moving with constant speed is
   (a) always zero (b) need not be zero (c) always non zero(d) cannot be concluded

2. The centrifugal force appears to exist
   (a) only in inertial frames (b) only in rotating frames (c) in any accelerated frame (d) both in inertial and non-inertial Frames

3. If a person moving from pole to equator, the centrifugal force acting on him
   (a) increases (b) decreases (c) remains the same (d) increases and then decreases

4. When a car takes a sudden left turn in the curved road, passengers are pushed towards the right due to
   (a) inertia of direction (b) inertia of motion (c) inertia of rest (d) absence of inertia

5. A vehicle is moving along the positive x direction, if sudden brake is applied, then
   (a) frictional force acting on the vehicle is along negative x direction
   (b) frictional force acting on the vehicle is along positive x direction
   (c) no frictional force acts on the vehicle
   (d) frictional force acts in downward Direction

6. A uniform force of $(2\hat{i}+\hat{j})$ N acts on a particle of mass 1 kg. Th e particle displaces from position $(3\ \hat{}\ \hat{j}\ \Box\ k)$ m to $(5\hat{i}\_ 3\hat{j})$ m. Th e work done by the force on the particle is
   (a) 9 J (b) 6 J (c) 10 J (d) 12 J

7. A body of mass 1 kg is thrown upwards with a velocity 20 m s−1. It momentarily comes to rest aft er attaining a height of 18 m. How much energy is lost due to air friction?.
   (a) 20 J (b) 30 J (c) 40 J (d) 10 J

8. If the linear momentum of the object is increased by 0.1%, then the kinetic energy is increased by
   (a) 0.1 % (b) 0.2% (c) 0.4% (d) 0.01%

9. Th e work done by the conservative force for a closed path is
   (a) always negative (b) zero (c) always positive (d) not defi ned

10. Th e potential energy of a system increases, if work is done
    (a) by the system against a conservative force
    (b) by the system against a nonconservative force

(c) upon the system by a conservative force

(d) upon the system by a nonconservative force

PART-B   ANY 7   7×2=14

1. Give the magnitude and direction of the net force acting on
   (a) A drop of rain falling down with constant speed.
   (b) A kite skillfully held stationary in the sky
2. If two objects of masses 2.5 kg and 100 kg experience the same force 5 N, what is the acceleration experienced by each of them?
3. When a cricket player catches the ball, he pulls his hands gradually in the direction of the ball's motion. Why?
4. What are the method to reduce friction
5. What is meant by pseudo force
6. When walking on ice one should take short steps. Why?
7. Define Elastic Potential Energy
8. A bullet of mass 50 g is fired from below into a suspended object of mass 450 g. The object rises through a height of 1.8 m with bullet remaining inside the object. Find the speed of the bullet. Take g = 10 ms-2.
9. Draw the graph of kinetic energy versus displacement. What information you can get from that graph

PART-C ANY 7

1. How is centripetal force provided in case of the following? (i) Motion of planet around the sun, (ii) Motion of moon around the earth. (iii) Motion of an electron around the nucleus in an atom
2. Relation between power and velocity
3. Calculate the centripetal acceleration of Moon towards the Earth
4. Relation between Momentum and Kinetic Energy
5. A weight lifter lifts a mass of 250 kg with a force 5000 N to the height of 5 m.
   a. What is the workdone by the weight lifter?
   b. What is the workdone by the gravity?
   c. What is the net workdone on the object.
6. Compare elastic and in elastic collision
7. Can the coefficient of friction be more than one?

8. What are the three scalar equation newton law
9. How does banking of roads reduce wear and tear of the tyres?
10. Explain three types inertia

PART-D

11. What are The following systematic steps are followed for developing the free body diagram: What is meant by angle of friction What are the method to reduce friction

12. State the empirical laws of static and kinetic friction

          OR

    Difference between centrifugal and centripetal

13. An object of mass 100 g is thrown with initial velocity $\vec{v} = 5(\hat{i}+\hat{j})$ m s -1 with respect to the ground. Neglect the effect of air on the motion of mass and take g = 10 m s -2 a. Draw the free body diagrams for the mass when it is at the highest position and before it hits the ground b. What is the impulse transferred by the mass when it hits the ground. c. What is the angle between the velocity and acceleration of the mass just before it hits the ground?

                    OR

    Derive velocities after the collision in terms of velocities before collision in elastic collision in one dimension case.

14. State and prove work-kinetic energy theorem.

              OR

    Discuss the bending of a cyclist in curves.

15. Show that in an inclined plane, angle of friction is equal to angle of repose

                OR

    Explain the motion of blocks connected by a string in i) Vertical motion

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