

VGR COACHING CENTER**CLASS XI****PHYSICS****MARK-70****PART-A**

1. If a particle executes uniform circular motion in the xy plane in clock wise direction, then the angular velocity is in
(a) +y direction (b) +z direction (c) -z direction (d) -x direction
2. Which one of the following physical quantities cannot be represented by a scalar?
(a) Mass (b) length (c) momentum (d) magnitude of acceleration
3. If a particle has negative velocity and negative acceleration, its speed
(a) increases (b) decreases (c) remains same (d) zero
4. If one object is dropped vertically downward and another object is thrown horizontally from the same height, then the ratio of vertical distance covered by both objects at any instant t is
(a) 1 (b) 2 (c) 4 (d) 0.5
5. If a particle executes uniform circular motion, choose the correct statement
(a) The velocity and speed are constant. (b) The acceleration and speed are constant.
(b) The velocity and acceleration are constant. (d) The speed and magnitude of acceleration are constant
6. The resultant of two vectors A and B is perpendicular to vector A and its magnitude is equal to half of the magnitude of vector B. Then the angle between A and B is
a) 30° b) 45° c) 150° d) 120°
7. The length of a body is measured as 3.51 m, if the accuracy is 0.01mm, then the percentage error in the measurement is
a) 351% b) 1% c) 0.28% d) 0.035%
8. The density of a material in CGS system of units is 4 g cm^{-3} . In a system of units in which unit of length is 10 cm and unit of mass is 100 g, then the value of density of material will be
a) 0.04 b) 0.4 c) 40 d) 400
9. The velocity of a particle v at an instant t is given by $v = at + bt^2$. The dimensions of b is

a) [L] b) [LT-1] c) [LT-2] d) [LT-3]

10. If the error in the measurement of radius is 2%, then the error in the determination of volume of the sphere will be

a) 8% b) 2% c) 4% d) 6%

PART-B ANY 7

11. Define vibratory motion with example

12. Differentiate scalar and vector quantity

13. Check whether the following vectors are orthogonal.

1. $A=2i+3j$ and $B=4i-5j$

2. $A=5I+2J$ $B=2I-5J$

14. Suppose two trains A and B are moving with uniform velocities along parallel tracks but in opposite directions. Let the velocity of train A be 40 km h⁻¹ due east and that of train B be 40 km h⁻¹ due west. Calculate the relative velocities of the trains

15. An object is thrown vertically downward. What is the acceleration experienced by the object?

16. What are the assumption taking place in projectile motion

17. Define angular velocity and angular acceleration

18. How do you deduce that two vectors are perpendicular?

19. Define a radian?

PART-C ANY 7

20. Discuss the properties of vector products.

21. Write a short note on the scalar product between two vectors.

22. Write the kinematic equation for linear motion and angular motion

23. What is the relationship between Velocity and angular velocity.

24. Suppose an object is thrown with initial speed 10 m s⁻¹ at an angle $\pi/4$ with the horizontal, what is the range covered? Suppose the same Object is thrown similarly in the Moon, will there be any change in the range? If yes, what is the change? (The acceleration due to gravity in the Moon $g_{moon} = 1/6 g$)

25. Projectile in horizontal projection find the value of i. range ii. Time flight off

26. If the position vector of the particle is given by $r=3t^2i+5tj+4k$, Find the

i. The velocity of the particle at $t = 3$ s

ii. Speed of the particle at $t = 3$ s

iii. acceleration of the particle at time $t = 3 \text{ s}$

27. Explain different types of vector

28. Limitation of dimensional analysis

PART-D ANY 5

1. Explain in detail the triangle law of Addition
2. Derive the kinematic equations of motion for constant acceleration.
3. Derive the equations of motion for a particle (a) falling vertically (b) projected vertically
4. Derive the equation of motion, range and maximum height reached by the particle thrown at an oblique angle θ with respect to the horizontal direction.
5. The force F acting on a body moving in a circular path depends on mass of the body (m), velocity (v) and radius (r) of the circular path. Obtain the expression for the force by dimensional analysis method. (Take the value of $k=1$)
6. If the value of universal gravitational constant in SI is $6.6 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$, then find its value in CGS System?