

O.P.JINDAL SCHOOL, SAVITRI NAGAR
PERIODIC TEST –I (Round-2) (2024-25)

CLASS-XI
SUBJECT-PHYSICS

MAX.MARKS-20
MAX.TIME-1HOUR

General Instruction:-

- (i) All questions are compulsory. There are 12 questions in this question paper with internal choice.
- (ii) **SECTION –A:** Question numbers 1 to 6 are MCQs, carrying 1 mark each.
- (iii) **SECTION –B:** Question numbers 7 to 10 are short answer questions carrying 2 marks each.
- (iv) **SECTION –C:** Question numbers 11 and 12 are long questions carrying 3 marks each.

SECTION-A

Q1. A unit vector along $i+j$ is

- (a) k (b) $\frac{i+j}{\sqrt{2}}$
 (c) $\frac{i+j}{2}$ (d) $i+j$

Q2. If $\vec{A}+\vec{B}=4\hat{j}$ and $\vec{A}-\vec{B}=2\hat{i}$ then the angle between \vec{A} and \vec{B} is

- (a) 37° (b) 53°
 (c) 127° (d) 60°

Q3. If a vector $2\hat{i}+3\hat{j}+8\hat{k}$ is perpendicular to the vector $4\hat{j}-4\hat{i}+a\hat{k}$. Then the value of 'a' is

- (a) -1 (b) 1
 (c) -1/2 (d) 1/2

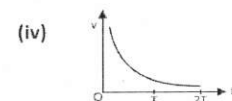
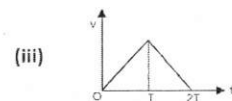
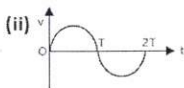
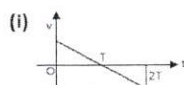
Q4. A body is projected at an angle of 45° with a velocity of 19.6ms^{-1} . Its horizontal range will

- (a) 19.6 m (b) 9.8 m
 (c) 39.2 m (d) 49m

Q5. The horizontal range and maximum height of a projectile are equal. The angle of projection of the projectile is

- (a) $\tan^{-1} \frac{1}{4}$ (b) $\tan^{-1} 4$
 (c) $\tan^{-1} 2$ (d) 45°

Q6. A ball is thrown vertically upward, then the velocity – time graph is



SECTION B

Q7. What is the angle of projection of a projectile if its speed at maximum height is half of its initial speed?

OR

From the top of building 19.6 m high, a ball is projected horizontally. After how long does it strike the ground?

Q8. Calculate the area of a triangle whose two sides are formed by the vectors

$\vec{A} = 3\mathbf{i} + 4\mathbf{j}$ and $\vec{B} = -3\mathbf{i} + 7\mathbf{j}$.

Q9. Prove the following equation of motion by method of calculus

$$S = ut + \frac{1}{2} at^2$$

Q10. A force $\vec{F} = 2\mathbf{i} - 3\mathbf{j} + 3\mathbf{k}$ acts on a body and displaces it from the position $\vec{r}_1 = \mathbf{i} + 2\mathbf{j} - 2\mathbf{k}$ to $\vec{r}_2 = 7\mathbf{i} + 10\mathbf{j} + 5\mathbf{k}$. Calculate work done by the force.

OR

$\vec{A} = \mathbf{i} + \mathbf{j} + \sqrt{2}\mathbf{k}$

Find the angles which a vector $\vec{A} = \mathbf{i} + \mathbf{j} + \sqrt{2}\mathbf{k}$ makes with (i) X axis (ii) Y axis (iii) Z axis.

SECTION C

Q11. The equation of a projectile is given by $y = \sqrt{3}x - \frac{gx^2}{2}$. Find

- (i) angle of projection
- (ii) speed of projection
- (iii) range of the projectile

Q12. (i) If two vectors $2\mathbf{i} + 3\mathbf{j} - \mathbf{k}$ and $-4\mathbf{i} - 6\mathbf{j} + \lambda\mathbf{k}$ are parallel to each other, then find value of λ .

$\vec{A} \quad \vec{B} \quad \vec{C}$

(ii) If vectors $\vec{A}, \vec{B}, \vec{C}$ have magnitude 8, 15 and 17 units and $\vec{A} + \vec{B} = \vec{C}$, find the angle between \vec{A} and \vec{B} .

OR

(i) If $y = 3x^2 - 2x$, then find maximum and minimum value of y .

(ii) If $x = 2t^3 - t^2$ where x is displacement of a particle and t is time in second then find maximum and minimum value of x .
