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

CLASS-XI   MAX.MARKS-20

SUBJECT-PHYSICS   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 3marks each.

SECTION-A

Q1. 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)$\tan^{-1} 4$
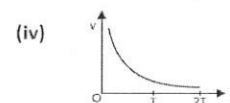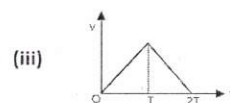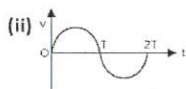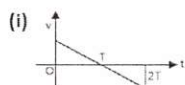
(c) $\tan^{-1} 2$ (d)45^0

Q2. 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

Q3. If $\vec{P}= -i+3j+ak$ is perpendicular to $\vec{Q}= 4i+2j+k$ then the value of a is

(a)-1   (b) 1

(c)-2   (d) 1/2

Q4.A ball is thrown vertically upward, then the velocity – time graph is

Q5. If $\vec{A}+\vec{B}=4j$ and $\vec{A}-\vec{B}=2i$ then the angle between $\vec{A}$ and $\vec{B}$ is

(a)37°   (b)53°

(c)127°   (d)60°

Q6. A unit vector along i+j is

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

(c) $\frac{i+j}{2}$ (d) i+j

SECTION B

Q7. Prove the following equation of motion by method of calculus

$$v^2 = u^2 + 2as$$

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

$\overrightarrow{P} = i+2j+3k$ and $\overrightarrow{Q} = 3i-2j+k$

Q9. A force F= 2i-3j+3k acts on a body and displaces it from the position r_1=i+2j-2k to r_2=7i+10j+5k. Calculate work done by the force.

OR

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

Q10. From a certain height, two bodies are projected horizontally with velocities 10m/s and 20m/s. They hit the ground in t_1 and t_2 seconds.

OR

A ball is projected upward from the top of tower with a velocity 50 m/s making angle 30° with horizontal .The height of tower is 70m. After how many seconds from instant of throwing will the ball reach the ground?

SECTION C

Q11. The equation of a projectile is given by y= 16x− $\dfrac{5x^2}{4}$. Find

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

Q12. (i)If two vectors 2i+ 3j−k and −4i−6j+⋋k are parallel to each other , then find value of ⋋.

(ii)If vectors $\overrightarrow{P}$, $\overrightarrow{Q}$, $\overrightarrow{R}$ have magnitude 3, 4 and 5 units and $\overrightarrow{P}$ + $\overrightarrow{Q}$ = $\overrightarrow{R}$, find the angle between P and Q.

OR

(i) If y= 3x²−2x ,then find maximum and minimum value of y.

(ii)If x = 2t³ – t² where x is displacement of a particle and t is time in second then find maximum and minimum value of x.

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