

11

Register No:

FIRST MID TERM - 2024

PHYSICS

Marks : 50

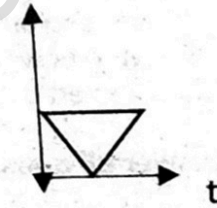
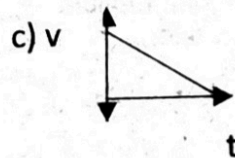
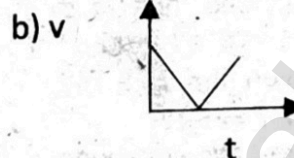
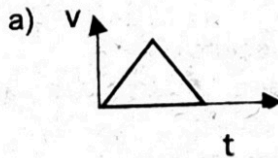
Time: 1:30hrs

PART - A

10 x 1 = 10

I. Choose the best answer

- The dimensional formula of Planck's constant 'h' is
a) $[ML^2T^{-2}]$ b) $[ML^2T^{-3}]$ c) $[MLT^{-1}]$ d) $[ML^3T^{-3}]$
- The dimension of $(\mu_0 \epsilon_0)^{1/2}$ is
a) length b) time c) velocity d) force
- One of the combinations from the fundamental physical constants is $\frac{hc}{G}$.
The unit of this expression is
a) kg^2 b) m^3 c) 3^{-1} d) m
- A ball is projected vertically upwards with a velocity v. it comes back to ground in time t. Which v- t. graph shows the motion correctly?



- Which one of the following physical quantities cannot be represented by a scalar?
a) Mass b) length c) momentum d) magnitude
- If an object is thrown vertically up with initial speed u from the ground, the time taken by the object to return back to ground, then the time taken by the object to return back to ground is
a) $\frac{u^2}{2g}$ b) $\frac{u^2}{g}$ c) $\frac{u}{2g}$ d) $\frac{2u}{g}$
- If the velocity is, then the magnitude of acceleration at $t = 0.53$ is
a) $1ms^{-2}$ b) $2ms^{-2}$ c) zero d) $-1ms^{-2}$
- If force [F], acceleration [A] and time [T] are chosen as fundamental physical quantities. Find the dimension of energy.
a) $[F][A][T]$ b) $[F][A][T^2]$ c) $[F][A][T^{-1}]$ d) $[F][A^{-1}][T]$
- A bullet is fired from a gun at the speed of $280ms^{-1}$ in the direction 30° above the horizontal. The maximum height attained by the bullet is $[g=908ms^{-2}]$ $[\sin 30^\circ=0.5]$
a) 2000m b) 1000m c) 3000m d) 2800m
- The value of one astronomical unit is _____
a) $1.496 \times 10^{-11}m$ b) $1.496 \times 10^{-22}m$
c) $1.496 \times 10^{11}m$ d) $1.496 \times 10^{15}m$

II PART B**II. Answer any five questions.****Q No. 13 is compulsory****5 x 2 = 10**

11. Define precision and accuracy.
12. From a point on the ground, the top of a tree is seen to have an angle of elevation 60° . The distance between the tree and a point is 50m. calculate the height of the tree
13. Two resistances $R_1 = (100 \pm 3)\Omega$, $R_2 = (150 \pm 2)\Omega$ are connected in series. What is their equivalent resistance?
14. Define a radian.
15. What is non – uniform circular motion?
16. What is the difference between velocity and average velocity?

PART – C**III. Answer any five questions.****Q. No. 20 is compulsory****5 x 3 = 15**

17. What are the limitations of dimensional analysis.
18. Write a note on the following
a) unit b) Dimensionless quantities
19. Write a short note on vector product of two vectors.
20. Two vectors are given $\vec{r} = 2\hat{j} + 3\hat{j} + 5\hat{k}$ and $\vec{F} = 3\hat{i} - 2\hat{j} + 4\hat{k}$ find the resultant vector. $\vec{c} = \vec{r} \times \vec{F}$
21. Write down the Kinematic equations for angular motion.
22. Convert the vector $\vec{r} = 3\hat{j} + 2\hat{j}$ into a unit vector.

PART – D**IV. Answer all questions in details****3 x 5 = 15**

23. a) Explain in detail the various types of errors.
(or)
b) If the value of universal gravitational constant is $6.6 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$, then find its value in CGS System.
24. a) Explain in detail the triangle law of addition.
(or)
b) Derive the expression for centripetal acceleration.
25. a) Write a note on radar method to measure large distances.
(or)
b) Discuss the properties of scalar and vector products (any five properties).