

Standard XI PHYSICS

Time : 1.30 hrs

Part - I

Marks : 50

1. Choose the correct answer.

10 x 1 = 10

1. 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%
2. The dimensional formula for gravitational constant G is
 a) $[ML^3T^{-2}]$ b) $[M^{-1}L^3T^{-2}]$ c) $[M^{-1}L^{-3}T^{-2}]$ d) $[ML^{-3}T^2]$
3. Which of the following pairs of physical quantities have same dimension?
 a) force and power b) torque and energy
 c) torque and power d) force and torque
4. Which of the following has the highest number of significant figures?
 a) 0.007 m^2 b) $2.64 \times 10^{24} \text{ kg}$ c) 0.0006032 m^2 d) 6.3200 J
5. One light year = _____.
 a) $8.467 \times 10^{15} \text{ m}$ b) $8.467 \times 10^{13} \text{ m}$
 c) $9.467 \times 10^{15} \text{ m}$ d) $9.467 \times 10^{13} \text{ m}$
6. If the velocity is $\vec{v} = 2\hat{i} + t^2\hat{j} - 9\hat{k}$, then the magnitude of acceleration at $t = 0.5 \text{ s}$ is _____.
 a) 1 ms^{-2} b) 2 ms^{-2} c) zero d) -1 ms^{-2}
7. Identify the unit vector in the following:
 a) $\hat{i} + \hat{j}$ b) $\frac{\hat{i}}{\sqrt{2}}$ c) $\hat{k} - \frac{\hat{j}}{\sqrt{2}}$ d) $\frac{\hat{i} + \hat{j}}{2}$
8. If a particle has negative velocity, negative acceleration, its speed _____.
 a) increases b) decreases c) remains same d) zero
9. If an object is thrown vertically up with the initial speed u from the ground, then the time taken by the object to return back to ground is _____.
 a) $\frac{u^2}{2g}$ b) $\frac{u}{g}$ c) $\frac{u}{2g}$ d) $\frac{2u}{g}$
10. Which one of the following is a vector quantity?
 a) Distance b) Displacement c) Speed d) Energy

Part - II

II. Answer any five questions. (Q.No.16 is compulsory)

5 x 2 = 10

11. Explain the types of physical quantities.
12. What are the uses of dimensional analysis?
13. What is meant dimensionless constant? Give an example.
14. Define a radian.
15. Define a vector. Give examples.
16. 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 50 m. Calculate the height of the tree.
17. Define displacement and distance.
18. Define acceleration.

Part - III

III. Answer any five questions. (Q.No.24 is compulsory)

5 x 3 = 15

19. Write the rules for determining significant figures. (any 3)
20. Explain the principle of homogeneity dimensions. Give example.
21. What are the limitations of dimensional analysis?
22. What is meant by Gross Error? How it is minimized?
23. Write down the kinematic equations for angular motion.
24. Two vectors $\vec{A}$ and $\vec{B}$ are given in the component form as $\vec{A} = 5\hat{i} + 7\hat{j} - 4\hat{k}$ and $\vec{B} = 6\hat{i} + 3\hat{j} + 2\hat{k}$, Find $\vec{A} + \vec{B}$, $\vec{A} - \vec{B}$
25. Discuss the properties of scalar products.
26. What is the difference between velocity and average velocity.

Part - IV

IV. Answer all the questions.

3 x 5 = 15

27. a) Obtain an expression for the time period T of a simple pendulum. The time period T depends upon (i) mass ' m ' of the bob. (ii) length ' l ' of the pendulum and (iii) acceleration due to gravity ' g ' at the place where the pendulum is suspended. (Constant $k = 2\pi$)
(OR)
b) Derive the equations of motion for a particle.
(a) falling vertically (b) projected vertically
28. a) Explain in detail the triangle law of addition.
(OR)
b) Write a note on triangulation method and radar method to measure larger distances.
29. a) What do you mean by propagation of errors? Explain the propagation of errors in addition.
(OR)
b) Derive the kinematic equations of motion for constant acceleration.

Standard XI PHYSICS

Time: 1.30 hrs.

Part – I

Marks: 50

10 x 1 = 10

I. Choose the correct answer:

1. 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%
2. Round of the following number 19.95 into three significant figures
a) 19.9 b) 20.0 c) 20.1 d) 19.5
3. The dimensional formula of Plank's constant h is
a) $[ML^2T^{-1}]$ b) $[ML^2T^{-3}]$ c) $[MLT^{-1}]$ d) $[ML^3T^{-3}]$
4. The dimension of $(\mu_0 t_0)^{1/2}$ is
a) length b) time c) velocity d) force
5. Which one of the following physical quantities cannot be represented by a scalar?
a) mass b) length c) momentum d) magnitude of acceleration
6. If the velocity is $\vec{v} = 2\hat{i} + t^2\hat{j} - 9\hat{k}$, then the magnitude of acceleration at $t = 0.5s$ is
a) 1 ms^{-2} b) 2 ms^{-2} c) zero d) -1 ms^{-2}
7. 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
8. If a particle executes uniform circular motion in the xy plane in clockwise direction then the angular velocity is in
a) $+y$ direction b) $+z$ direction c) $-z$ direction d) $-x$ direction.
9. The number of significant figure in $2.651 \times 10^5 \text{ m}$
a) 3 b) 4 c) 5 d) 6
10. The velocity of a particle is $\hat{i} + 2\hat{j} - 3\hat{k}$, then the speed of the particle
a) $\sqrt{5} \text{ ms}^{-1}$ b) $\sqrt{14} \text{ ms}^{-1}$ c) $\sqrt{6} \text{ ms}^{-1}$ d) $\sqrt{2} \text{ ms}^{-1}$

Part - II

II. Answer any 5 questions. (Q.No.18 is compulsory)

5 x 2 = 10

11. Define precision and accuracy.
12. State the principle of homogeneity of dimensions.
13. Check the correctness of the equation $\frac{1}{2}mv^2 = mgh$ using dimensional analysis method.
14. Define a radian.

15. What is non uniform circular motion?
16. How do you deduce that two vectors are perpendicular.
17. Explain what is meant by cartesian co-ordinate system.
18. 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 50 m. Calculate the height of the tree.

Part - III

III. Answer any 5 questions. (Q.No.26 is compulsory)

5 x 3 = 15

19. Explain the types of physical quantities.
20. Write the rules for determining significant figures
21. What are the limitations of dimensional analysis?
22. Define scalar and vector. Give examples.
23. A train was moving at the rate of 54 kmh^{-1} . When brakes were applied, it came to rest within a distance of 225 m. Calculate the retardation produced in the train.
24. Define displacement and distance.
25. Write down the Kinematic equations for angular motion.
26. Two vectors are given as $\vec{r} = 2\vec{i} + 3\vec{j} + 5\vec{k}$ and $\vec{F} = 3\vec{i} - 2\vec{j} + 4\vec{k}$. Find the resultant vector $\vec{\tau} = \vec{r} \times \vec{F}$

Part - IV

IV. Answer all the questions.

3 x 5 = 15

27. a) Write a note on triangulation method and radar method to measure larger distance.

(OR)

- b) Explain in detail the various types of errors

28. a) Obtain an expression for the time period T of a simple pendulum using dimensional analysis.

(OR)

- b) Derive the kinematic equation of motion for constant acceleration.

29. a) Explain in detail the triangular law of addition.

(OR)

- b) Derive the expression for centripetal acceleration.



BLESSING

TUITION & TUTORIAL CENTRE

11TH STD PHYSICS

1ST MID TERM IMPORTANT QUESTION 2026 & 27

**MOST EXPECTED
2, 3 & 5 MARKS
QUESTIONS**

UNIT - 1

I - Two mark very short answer questions

1. Define one radian (S.I standard for plane angle)
2. Write a note on parallax method.
3. One Light Year.
4. Define one astronomical unit (AU).
5. Write a note on absolute errors.
6. Define relative error.
7. Define dimensional variables.
8. Define dimensionless variables.
9. Define dimensional constants.
10. Define dimensionless constants.

II - Three mark short answer questions

1. How will you measure the diameter of the Moon using Parallax method?
2. Explain the determination of distance of Moon from Earth using Parallax method.
3. Define accuracy and precision.
4. Explain the principle of homogeneity of dimensions.
5. Give the applications of the method of dimensional analysis.
6. Give the limitations of dimensional analysis.

III - Five mark long answer questions

1. Write a note on triangulation method and radar method to measure larger distances.
2. Explain in detail the various types of errors.
3. Explain the Propagation of errors in (i) addition (ii) multiplication
4. What are the rules for counting significant figures?

Important problems

1. A physical quantity x is given by $x = \frac{a^3 b^3}{c^2 d}$. If the percentage errors of measurement in a , b , c and d are 4%, 2%, 3% and 1% respectively, then calculate the percentage error in the calculation of x .
2. Check the correctness of the equation $\frac{1}{2}mv^2 = mgh$ using dimensional method.
3. Convert 76 cm of mercury pressure into Nm^{-2} using the method of dimensions.
4. Obtain an expression for the time period T of a simple pendulum. The time period T depends on (i) mass ' m ' of the bob (ii) length ' l ' of the pendulum and (iii) acceleration due to gravity g at the place where the pendulum is suspended. (Constant $k = \frac{2\pi}{\sqrt{g}}$)

UNIT - 2

I - Two mark very short answer questions

1. Define scalar or dot product of two vectors.
2. Define vector or cross product of two vectors.
3. How will you prove that two vector are orthogonal?
4. Define acceleration (instantaneous acceleration).
5. Define projectile. Give examples.
6. Give the angle of projection for which the range become maximum.
7. Define angular displacement, angular velocity and angular acceleration.
8. Define uniform circular motion.
9. Define centripetal acceleration. Give the expression for it.
10. Define non - uniform circular motion.
11. Define speed and velocity.
12. What is the relative velocity?

II - Three mark short answer questions

1. Give the equations of motion against gravity and under gravity
2. Obtain an expression for tangential acceleration experienced by the object in circular motion.
3. Derive the expression for centripetal acceleration.
4. Give the kinematic equations of circular motion.

III - Five mark long answer questions

1. Explain in detail the triangle law of addition.
2. Discuss the properties of scalar product.
3. Discuss the properties of vector product.
4. Derive the kinematic equations of motion for constant acceleration.

Important problems

1. Two vectors are given as $\vec{F} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ and $\vec{F} = 3\hat{i} - 2\hat{j} + 4\hat{k}$. Find the resultant vector $\vec{F} \times \vec{F}$
2. An object at an angle such that the horizontal range is 4 times of the maximum height. What is the angle of projection of the object?
3. Calculate the area of the triangle for which two of its sides are given by the vectors $\vec{A} = 5\hat{i} - 3\hat{j}$ and $\vec{B} = 4\hat{i} + 6\hat{j}$

UNIT - 3

I - Two mark very short answer questions

1. What is transverse wave?
2. What is longitudinal wave?
3. Define wavelength.
4. Define wave number.
5. Give the relation between velocity (v), angular velocity (ω) and wave number (k)
6. Define amplitude of the wave.
7. What is progressive wave (or) travelling wave?
8. Define principle of superposition.
9. Define interference.
10. Give the relation between phase difference and path difference.
11. What are called beats?
12. What are called stationary waves?
13. Define intensity of sound.
14. Define inverse square law of sound intensity.
15. Define loudness of sound.
16. State Weber-Fechner's law.

II - Three mark short answer questions

1. Define harmonic and overtones.
2. What are the properties of wave motion.
3. Distinguish between transverse and longitudinal waves.
4. Obtain the relation between frequency and wavelength.
5. List the characteristics of progressive waves.
6. Explain an experiment to demonstrate the interference of sound waves.
7. Write down the characteristics of stationary waves
8. Briefly explain the difference between travelling waves and standing waves.
9. State the laws of transverse vibrations in a stretched string.

III - Five mark long answer questions

1. Derive the expression for the velocity of a travelling wave produced in a string
2. Describe Newton's formula for velocity of sound waves in air and also discuss Laplace correction.
3. Explain the theory of interference of waves formed.
4. Explain how overtones are produced in a closed organ pipe.
5. Explain how overtones are produced in a closed organ pipe.

UNIT - 6

I - Two mark very short answer questions

1. State geocentric model of Solar system.
2. State Heliocentric model of Solar system.
3. State Newton's universal law of gravitation.
4. Define gravitational field (gravitational field intensity).
5. Distinguish between gravitational field and gravitational potential.
6. Define acceleration due to gravity.
7. Define escape speed.
8. Define orbital velocity of a satellite.
9. Why is the energy of a satellite (or other planet) is negative?
10. What are geostationary satellites?
11. What are polar satellites?

II - Three mark short answer questions

1. Explain in detail the idea of weightlessness using lift as an example.
2. Explain the weightlessness in satellites.

III - Five mark long answer questions

1. Prove that at points near the surface of the Earth, the gravitational potential energy of the object is $U = mgh$
2. Explain the variation of acceleration due to gravity ' g ' with altitude
3. Explain the variation of acceleration due to gravity ' g ' with latitude
5. Derive an expression for orbital speed
6. Discuss the apparent weight of man standing inside the elevators.

Important problems

1. If the masses and mutual distance between the two objects are doubled, what is the change in the gravitational force between them?
2. If the angular momentum of a planet is given by $\vec{J} = 5t^2\hat{i} - 6t\hat{j} + 3\hat{k}$. What is the torque experienced by the planet? Will the torque be in the same direction as that of the angular momentum?

UNIT - 7

I - Two mark very short answer questions

1. Define stress.
2. Define strain.
3. Define elastic limit.
4. State Hooke's law.
5. Define Poisson's ratio.
5. Which one is more elastic? Rubber or Steel?
7. Define coefficient of viscosity.
8. Define streamline flow.
9. Define turbulent flow.
10. Define surface tension.
11. Define angle of contact.
12. Define capillarity
13. Two streamlines cannot cross each other. Why?

II - Three mark short answer questions

1. Give the applications of viscosity.
2. Give the practical applications of capillarity.
3. Give the applications of surface tension.
4. Define Reynolds number. Give its importance.
5. Distinguish between cohesive force and adhesive force.
6. Explain the various factors affecting the surface tension of a liquid.
7. Obtain an equation of continuity for a flow of fluid on the basis of conservation of mass
8. What is the principle involved in the Searle's method?

III - Five mark long answer questions

1. Derive an expression for the elastic energy stored per unit volume of a wire.
2. Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using Stokes force.
3. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.
3. Obtain an expression for the excess of pressure inside a (1) liquid drop (2) liquid (soap) bubble and (3) air bubble.

UNIT - 11

I - Two mark very short answer questions

1. What is transverse wave?
2. What is longitudinal wave?
3. Define wavelength.
4. Define wave number.
5. Give the relation between velocity (v), angular velocity (ω) and wave number (k)
6. Define amplitude of the wave.
7. What is progressive wave (or) travelling wave?
8. Define principle of superposition.
9. Define interference.
10. Give the relation between phase difference and path difference.
11. What are called beats?
12. What are called stationary waves?
13. Define intensity of sound.
14. Define inverse square law of sound intensity.
15. Define loudness of sound.
16. State Weber-Fechner's law.

II - Three mark short answer questions

1. Define harmonic and overtones.
2. What are the properties of wave motion.
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9. State the laws of transverse vibrations in a stretched string.



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