

SECOND REVISION TEST - 2025

Standard XI

Reg.No. 11A022

PHYSICS

Time : 3.00 hrs

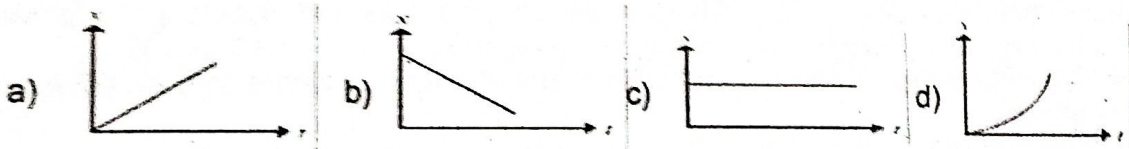
Part - I

Marks : 70

15 x 1 = 15

I. Choose the correct answer:

- 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
- If a person moves from Chennai to Trichy, his weight
a) increases b) decreases c) remains same d) increases and then decreases
- The efficiency of a heat engine working between the freezing point and boiling point of water is
a) 6.25% b) 20% c) 26.8% d) 12.5%
- For a given gas molecule at a fixed temperature, the area under the Maxwell-Boltzmann distribution curve is equal to
a) $\frac{PV}{KT}$ b) $\frac{KT}{PV}$ c) $\frac{P}{NKT}$ d) PV
- Error in the measurement of radius of a circle is 1%. Then error in the measurement of area is
a) 2 % b) 1 % c) 3 % d) 4 %
- Which of the following graphs represents the position time graph of a particle moving with negative velocity?



- Force acting on the particle moving with constant speed is
a) always zero b) need not be zero c) always non zero d) cannot be concluded
- A spring of force constant k is cut into two pieces such that one piece is double the length of the other. Then, the long piece will have a force constant of
a) $\frac{2}{3}k$ b) $\frac{3}{2}k$ c) $3k$ d) $6k$
- A couple produces,
a) Pure rotation b) pure translation c) rotation and translation d) no motion
- 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
- Consider two springs whose force constants are 1 Nm^{-1} and 2 Nm^{-1} which are connected in series. Calculate the effective spring constant (k_s).
a) 6 Nm^{-1} b) $\frac{3}{2} \text{ Nm}^{-1}$ c) 3 Nm^{-1} d) $\frac{2}{3} \text{ Nm}^{-1}$
- Equation of travelling wave on a stretched string of linear density 5 g/m is $y = 0.03 \sin(450t - 9x)$, where distance and time are measured in SI units. The tension in the string is
a) 5 N b) 12.5 N c) 7.5 N d) 10 N
- In a simple harmonic oscillation, the acceleration against displacement for one complete oscillation will be
a) an ellipse b) a circle c) a parabola d) a straight line
- The Young's modulus for a perfect rigid body is
a) 0 b) 1 c) 0.5 d) infinity

15. Bernoulli's equation is valid
 a) constant, viscous, incompressible, temperature dependent flow.
 b) variable, non-viscous, incompressible, temperature- dependent flow.
 c) constant, non-viscous, incompressible, temperature- independent flow.
 d) variable, non-viscous, incompressible, temperature- independent flow.

Part - II

II. Answer any 6 questions. (Q.No.24 is compulsory)

6 x 2 = 12

16. What are the uses of dimensional analysis.
 17. An athlete covers 5 rounds on a circular track of radius 100 m. Calculate the total distance and displacement travelled by him
 18. State Newton's Universal law of gravitation.
 19. Define Poisson's ratio.
 20. What is impulse or impulsive force?
 21. Give any two examples of torque in day-to-day life.
 22. Define the coefficient of performance.
 23. Why moon has no atmosphere?
 24. Calculate the work done by a force of 30 N in lifting a load of 2kg to a height of 10m

(g = 10 ms⁻²)

Part - III

III. Answer any 6 questions. (Q.No.33 is compulsory)

6 x 3 = 18

25. What are the factors affecting Brownian motion?
 26. Explain resonance. Give an example.
 27. Write the rules for determining significant figures.
 28. Draw the free body diagram for mango hanging from a tree and calculate the tension acting on the mango. (Given mass of the mango is 400 gm and g = 10 m/s²).
 29. Write the differences between conservative and Non-conservative forces. Give two examples each.
 30. Write down the kinematic equations for linear motion and angular motion.
 31. A force of $(4\hat{i} - 3\hat{j} + 5\hat{k})$ N is applied at a point whose position vector is $(7\hat{i} + 4\hat{j} - 2\hat{k})$ m. Find the torque of force about the origin.
 32. What is weightlessness? Give an example.
 33. If excess pressure is balanced by a column of oil (with specific gravity 0.8) 4 mm high, where R = 2.0 cm, find the surface tension of the soap bubble.

Part - IV

IV. Answer all the questions.

5 x 5 = 25

34. a) i) Write a note on radar method to measure larger distances.
 ii) The temperatures of two bodies measured by a thermometer are $t_1 = (20 \pm 0.5)^\circ\text{C}$, $t_2 = (50 \pm 0.5)^\circ\text{C}$. Calculate the temperature difference and the error therein. (OR)
 b) State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow fluid.
 35. a) Explain the variation of g with depth from the Earth's surface. (OR)
 b) Describe the total degrees of freedom for monoatomic molecule, diatomic molecule and triatomic molecule.
 36. a) Prove that the frequencies of harmonics are in the ratio for the open organ pipes, $f_1 : f_2 : f_3 : f_4 : \dots = 1 : 2 : 3 : 4 : \dots$ (OR)
 b) Explain in detail Newton's law of cooling.
 37. a) Discuss the properties of scalar products. (OR)
 b) Explain in details about elastic collisions in one dimension
 38. a) Explain the motion of blocks connected by a string in Vertical motion. (OR)
 b) State and prove Perpendicular axis theorem.

FIRST REVISION TEST - 2025

11A022

Standard - XI

Time: 3.00 hrs

PHYSICS

Marks: 70

Part - A

I Answer all the questions. Choose the correct answers.

15x1=15

- If the masses of the Earth and Sun suddenly double, the gravitational force between them will.
 - remains the same
 - increase 2 times
 - increase 4 times
 - decrease 2 times
- The Wettability of a Surface by a liquid depends primarily on
 - viscosity
 - surface tension
 - density
 - angle of contact between the surface and the liquid
- The efficiency of a heat engine working between the freezing point and boiling point of water is _____.
 - 6.25%
 - 20%
 - 26.8%
 - 12.5%
- The ratio $\gamma = \frac{C_p}{C_v}$ for a gas mixture consisting of 8g of helium and 16g of oxygen is _____.
 - $\frac{23}{15}$
 - $\frac{15}{23}$
 - $\frac{27}{17}$
 - $\frac{17}{27}$
- In a simple harmonic oscillation, the acceleration against displacement for one complete oscillation will be _____.
 - an ellipse
 - a circle
 - a parabola
 - a straight line
- A sound wave whose frequency is 5000 Hz travels in air and then hits the water surface. The ratio of its wavelengths in water and air is _____.
 - 4.30
 - 0.23
 - 5.30
 - 1.23
- Force acting on the particle moving with constant speed is
 - always zero
 - need not be zero
 - always non-zero
 - cannot be concluded

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- PART - B**

$$6 \times 2 = 12$$

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19. State Stefan - Boltzmann law.
20. Write down the relation between frequency, wavelength and velocity of a wave.
21. Which one of these is more elastic, steel or rubber? Why?
22. Difference between distance and displacement.
23. State the law of equipartition of energy.
24. During a cyclic process, a heat engine absorbs 500J of heat from a hot reservoir, does work and ejects an amount of heat 300J into the surroundings. Calculate the efficiency of the heat engine?

PART - C

III. Answer any six questions. Question number 33 is compulsory.

6x3=18

25. Give the applications of dimensional analysis.
26. If the position vector of the particle is given by $\vec{r} = 3t^2\hat{i} + 5t\hat{j} + 4\hat{k}$. Find
 - a) The velocity of the particle at $t=35$
 - b) Speed of the particle at $t=35$
27. Explain about the geostationary and polar satellites.
28. State the laws of simple pendulum?
29. Explain the types of thermal expansion.
30. Difference between progressive waves and standing waves.
31. State Newton's laws of motion?
32. Distinguish between elastic and inelastic collision.
33. If a flute sounds a note with 450Hz, what are the frequencies of the second, third, and fourth harmonics of this Pitch?

PART - D

IV. Answer in detail.

5x5=25

34. a) Derive Mayer's relation for an ideal gas.

(OR)

- b) Explain how overtones are produced in a closed organ pipe.

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35. a) Explain in detail the various types of errors.

(OR)

b) State and Prove parallel axes theorem.

36. a) Show that in an inclined plane, angle of friction is equal to angle of repose.

(OR)

b) Explain the variation of acceleration due to gravity "g" with altitude.

37. a) Explain different types of modulus of Elasticity.

(OR)

b) Explain the horizontal oscillations of a Spring.

38. a) Obtain an expression for the relation between power and velocity.

(OR)

b) Explain in detail the triangle law of addition.

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COMMON HALF YEARLY EXAMINATION - 2024

Standard XI

Reg.No. 114022

PHYSICS

Time : 3.00 hrs

Part - A

Marks : 70

15 × 1 = 15

I. Choose the correct answer:

1. Round off the following number 19.95 into three significant figures
 - a) 19.9
 - b) 20.0
 - c) 20.1
 - d) 19.5
2. Which one of the following physical quantities cannot be represented by a scalar
 - a) mass
 - b) Length
 - c) momentum
 - d) acceleration
3. When a car takes a sudden left turn in the curved road, passengers are pushed towards the right due to
 - a) inertia of direction
 - b) inertia of motion
 - c) inertia of rest
 - d) absence of inertia
4. The work done by the conservative forces for a closed path is
 - a) always negative
 - b) zero
 - c) always positive
 - d) not defined
5. A couple produces
 - a) pure rotation
 - b) pure translation
 - c) rotation and translation
 - d) no motion
6. A rigid body rotates with an angular momentum L . If its kinetic energy is halved. The angular momentum becomes
 - a) L
 - b) $L/2$
 - c) $2L$
 - d) $L/\sqrt{2}$
7. If the masses of the earth and sun suddenly doubled. The gravitational forces between them will
 - a) remain the same
 - b) increases 2 times
 - c) increases 4 times
 - d) decreases 2 times
8. The gravitational potential energy of the moon with respect to Earth is
 - a) always positive
 - b) always negative
 - c) can be positive or negative
 - d) always Zero
9. If the mass and the radius of the earth are both doubled, then the acceleration due to the gravity g
 - a) remains same
 - b) $g/2$
 - c) $2g$
 - d) $4g$
10. If a wire is stretched to double of its original length, then the strain in the wire is
 - a) 1
 - b) 2
 - c) 3
 - d) 4
11. Which of the following is not the scalar?
 - a) viscosity
 - b) surface tension
 - c) pressure
 - d) stress
12. The Young's modulus for the perfect rigid body is
 - a) zero
 - b) 1
 - c) 0.5
 - d) infinity
13. If the temperature and the pressure of the gas is doubled the mean free path of the gas molecules
 - a) remains same
 - b) doubled
 - c) tripled
 - d) quadrupled
14. Two identical sized rooms A and B are connected by the open door. If the room A is Air conditioned. Such that its temperature is 4° lesser than the room B. Which room has more Air in it?
 - a) Room A
 - b) Room B
 - c) Both Rooms has same air
 - d) cannot be determined

- Part - B**
II. Answer any 6 questions. (Q.No.24 is compulsory)
16. Define a radian

16. Define a radian
17. Differentiate between scalar and a vector?
18. Write the types of friction?
19. Define Power.
20. Define centre of gravity?
21. How will you prove that earth itself is spinning?
22. State Hooks law of elasticity?
23. State the first law of thermodynamics?
24. From a point on the ground, the top of the tree is seen to have a angle of elevation 60° , the distance between the tree and a point is 50m. Calculate the height of the tree.

III. Answer any 6 questions. (Q.No.33 is compulsory)

25. Explain the principle of homogeneity of dimensions?
26. Define centripetal acceleration. Give the expression for it?
27. When a cricket player catches the ball, he pulls his hand in the direction of the ball motion. Why?
28. State kepler's three laws?
29. Write the practical application of capillarity?
30. Draw the PV diagram for a
 - i) Isothermal Process
 - ii) Adiabatic Process
31. State the law of simple pendulum?
32. Difference between transverse wave and longitudinal wave?
33. A box is pulled with a force of 25 N to produce a displacement of 15m. If angle between the force and the displacement is 30° . Find the work done by the force?

IV. Answer all the questions.

34. a) Explain in detail of various types of errors

b) Derive the kinematic equations of motion for constant accelerations

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SECOND MID TERM TEST - 2024

Standard XI

Reg.No.

1	1	A	0	2	2
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PHYSICS

Time : 1.30 hrs

Part - I

Marks : 50

10 x 1 = 10

1. Choose the correct answer:

1. The graph between volume and temperature in Charle's law is
 - a) an ellipse
 - b) a circle
 - c) a parabola
 - d) a straight line
2. When you exercise in the morning, by considering your body as thermodynamic system, which of the following is true?
 - a) $\Delta U < 0, W > 0$
 - b) $\Delta U > 0, W > 0$
 - c) $\Delta U < 0, W < 0$
 - d) $\Delta U = 0, W > 0$
3. In an isochoric process, we have
 - a) $W = 0$
 - b) $Q = 0$
 - c) $\Delta U = 0$
 - d) $\Delta T = 0$
4. With an increase in temperature, the viscosity of liquid and gas, respectively will
 - a) increase and increase
 - b) increase and decrease
 - c) decrease and increase
 - d) decrease and decrease
5. If the temperature of the wire is increased, then the Young's modulus will
 - a) remain the same
 - b) decrease
 - c) increase rapidly
 - d) increase by very a small amount
6. Two wires are made of the same material and have the same volume. The area of cross sections of the first and the second wires are A and 2A respectively. If the length of the first wire is increased by Δl on applying a force F. How much force is needed to stretched the second wire by the same amount?
 - a) 2 F
 - b) 4 F
 - c) 8 F
 - d) 16 F
7. Consider two wires X and Y. The radius of wire X is 3 times the radius of Y. If they are structured by the same load, then the stress on Y is
 - a) equal to that on X
 - b) thrice that on X
 - c) nine times that on X
 - d) half that on X
8. If the mass and radius of the Earth are both doubled, then the acceleration due to gravity 'g'
 - a) remains same
 - b) $g/2$
 - c) 2 g
 - d) 4 g
9. According to Kepler's second law, the radial vector to a planet from the Sun sweeps out equal areas in equal intervals of time. This law is a consequence of
 - a) conservation of linear momentum
 - b) conservation of angular momentum
 - c) conservation of energy
 - d) conservation of kinetic energy
10. An object of mass 10 kg is hanging on a spring scale which is attached to the roof of a lift. If the lift is in free fall, the reading in the spring scale is
 - a) 98 N
 - b) zero
 - c) 49 N
 - d) 9.8 N

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XI Physics

Part - II

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

5 x 2 = 10

11. Define the gravitational field. Give its unit.
12. What is meant by escape speed in the case of the Earth?
13. State Newton's Universal law of gravitation.
14. Which one of these is more elastic, steel or rubber? Why?
15. State the law of Flotation.
16. State Stefan-Boltzmann law.
17. What is PV diagram?
18. A wire of length 2 m with the area of cross-section 10^{-6} m^2 is used to suspend a load of 980 N. Calculate the stress developed.

Part - III

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

5 x 3 = 15

19. What are geostationary and polar satellites?
20. Why is there no lunar eclipse and solar eclipse every month?
21. Distinguish between streamlined flow and turbulent flow.
22. State the principle and usage of Venturi meter.
23. What are the factors affecting the surface tension of a liquid?
24. Define specific heat capacity and give its unit.
25. Why does heat flow from a hot object to a cold object?
26. A refrigerator has COP of 4. How much work must be supplied to the refrigerator in order to remove 200 J of heat from its interior?

Part - IV

IV. Answer all the questions.

3 x 5 = 15

27. a) Explain the variation of g with depth from the Earth's surface.
(OR)
- b) Explain in detail Newton's law of cooling.
28. a) Explain the different types of moduli of elasticity.
(OR)
- b) Discuss various modes of heat transfer.
29. a) Derive an expression for energy of satellite.
(OR)
- b) State and prove Bernoulli's theorem for a flow of incompressible non-viscous and streamlined flow of fluid.

COMMON QUARTERLY EXAMINATION - 2024

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Standard XI

Reg. No.

1	1	A	0	2	2
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PHYSICS

Time : 3.00 hrs

Part - I

Marks : 70

15 x 1 = 15

I. Choose the correct answer:

- If $\pi = 3.14$, then the value of π^2 is
 - 9.8596
 - 9.860
 - 9.86
 - 9.9
- The dimensional formula of Planck's constant h is
 - $[ML^2T^{-1}]$
 - $[ML^2T^{-3}]$
 - $[MLT^{-1}]$
 - $[ML^3T^{-3}]$
- The dimension of $(\mu_0 \epsilon_0)^{1/2}$ is
 - length
 - time
 - velocity
 - force
- Identify the unit vector in the following
 - $\hat{i} + \hat{j}$
 - $\frac{\hat{i}}{\sqrt{2}}$
 - $\hat{k} - \frac{\hat{j}}{\sqrt{2}}$
 - $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$
- If a particle has negative velocity and negative acceleration, its speed
 - increases
 - decreases
 - remains same
 - zero
- If an object is dropped from the top of a building and it reaches the ground at $t = 4s$, then the height of the building is (ignoring the air resistance) ($g = 9.8 \text{ ms}^{-2}$)
 - 77.3 m
 - 78.4 m
 - 80.5 m
 - 79.2 m
- Two masses m_1 and m_2 are experiencing the same force where $m_1 < m_2$. The ratio of their acceleration $\frac{a_1}{a_2}$ is
 - 1
 - less than 1
 - greater than 1
 - all the three cases

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XI Physics

8. Force acting on the particle moving with constant speed is
a) always zero
b) need not be zero
c) always non zero
d) cannot be concluded
9. The centrifugal force appears to exist
a) only in inertial frames
b) only in rotating frames
c) in any accelerated frames
d) both in inertial and non-inertial frames
10. The work done by the conservative force for a closed path is
a) always negative
b) zero
c) always positive
d) not defined
11. If the potential energy of the particle is $\propto -\frac{\beta}{2}x^2$, then force experienced by the particle is
a) $F = \frac{\beta}{2}x^2$
b) $F = \beta x$
c) $F = -\beta x$
d) $F = -\frac{\beta}{2}x^2$
12. A spring of force constant k is cut into two pieces such that one piece is double the length of the other, then the long piece will have a force constant of
a) $\frac{2}{3}k$
b) $\frac{3}{2}k$
c) $3k$
d) $6k$
13. A couple produces
a) pure rotation
b) pure translation
c) rotation and translation
d) no motion
14. A rigid body rotates with an angular momentum L . If its kinetic energy is halved, the angular momentum becomes
a) L
b) $\frac{L}{2}$
c) $2L$
d) $\frac{L}{\sqrt{2}}$
15. The speed of a solid sphere after rolling down from rest without sliding on an inclined plane of vertical height h is
a) $\sqrt{\frac{4}{3}gh}$
b) $\sqrt{\frac{10}{7}gh}$
c) $\sqrt{2gh}$
d) $\sqrt{\frac{1}{2}gh}$

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XI Physics

Part - II

II. Answer any 6 questions. (Q.No.24 is compulsory)

6 x 2 = 12

16. Write the applications of dimensional analysis.
17. Define a radian.
18. What is non-uniform circular motion?
19. A RADAR signal is beamed towards a planet and its echo is received 7 minutes later. If the distance between the planet and the earth is 6.3×10^{10} m. Calculate the speed of the signal?
20. Define impulsive force.
21. Define coefficient of restitution.
22. What is radius of gyration?
23. Give any two examples of torque in day-to-day life.
24. Calculate the energy consumed in electrical units when a 75 W fan is used for 8 hours daily for one month. (30 days)

Part - III

III. Answer any 6 questions. (Q.No.33 is compulsory)

6 x 3 = 18

25. How will you measure the diameter of the moon using parallax method?
26. Derive the relation between linear velocity and angular velocity.
27. Explain various types of friction. Suggest a few methods to reduce friction.
28. Arrive at an expression for power and velocity.
29. Consider a circular road of radius 20 meter banked at an angle of 15 degree.
With what speed a car has to move on the turn so that it will have safe turn?
30. Write the difference between conservative and non-conservative forces. Give two examples each.
31. State and explain conservation of angular momentum.
32. Explain the types of equilibrium with suitable examples. (Any 3)
33. Two vectors are given as $\vec{r} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ and $\vec{F} = 3\hat{i} - 2\hat{j} + 4\hat{k}$. Find the resultant vector
 $\vec{L} = \vec{r} \times \vec{F}$.

IV. Answer all the questions.

34. a) Write the rules for determining significant figures.

(OR)

b) Derive the expression for moment of inertia of a rod about its centre and perpendicular to the rod.

35. a) Discuss the properties of scalar products.

(OR)

b) Arrive at an expression for elastic collision in one dimension and discuss various cases.

36. a) Explain the motion of blocks connected by a string in vertical motion.

(OR)

b) 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.

37. a) State and explain work energy principle. Mention any three examples for it.

(OR)

b) Convert 76 cm of mercury pressure into Nm^{-2} using the method of dimensions.

38. a) State and prove parallel axis theorem.

(OR)

b) Derive an expression for particle moving in an inclined plane.

FIRST MID TERM TEST - 2024

Standard XI

Reg.No.

1	1	A	0	2	2
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PHYSICS

Time : 1.30 hrs

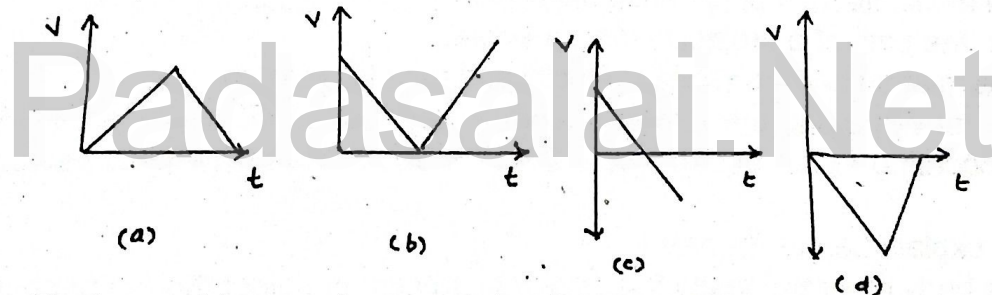
Part - I

Marks : 50

10 x 1 = 10

I. Choose the correct answer:

- 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%
- Round off the following number 19.95 into the three significant figures.
a) 19.9 b) 20.0 c) 20.1 d) 19.5
- 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]
- The dimension of $(\mu_0 \epsilon_0)^{-1/2}$ is
a) length b) time c) velocity d) force
- If the velocity is $\vec{v} = 2\hat{i} + t^2\hat{j} - 9\hat{k}$, then the magnitude of acceleration at $t = 0.5$ s is
a) 1 ms^{-2} b) 2 ms^{-2} c) zero d) -1 ms^{-2}
- 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?



- An object is dropped in an unknown planet from height 50 m, it reaches the ground in 2 s. The acceleration due to gravity in this unknown planet is
a) $g = 20 \text{ ms}^{-2}$ b) $g = 25 \text{ ms}^{-2}$ c) $g = 15 \text{ ms}^{-2}$ d) $g = 30 \text{ ms}^{-2}$
- When a car takes a sudden left turn in the curved road, passengers are pushed towards the right due to
a) inertia of direction b) inertia of motion
c) inertia of rest d) absence of inertia
- A book is at rest on the table which exerts a normal force on the book. If this force is considered as reaction force, what is the action force according to Newton's Third Law?
a) Gravitational force exerted by Earth on the book
b) Gravitational force exerted by the book on Earth
c) Normal force exerted by the book on the table
d) None of the above
- When an object is at rest on the inclined rough surface
a) Static and kinetic frictions acting on the object is zero
b) Static friction is zero but kinetic friction is not zero
c) Static friction is not zero and kinetic friction is zero
d) Static and the kinetic frictions are not zero

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Part - II

XI Physics

II. Answer any 5 questions. (Q.No.13 is compulsory)

5 x 2 = 10

11. What are the significant features of SI system?
12. Define one Steradian.
13. A RADAR signal is beamed towards a planet and its echo is received 7 minutes later. If the distance between the planet and the Earth is 6.3×10^{10} m. Calculate the speed of the signal.
14. Define displacement and distance.
15. What is your projectile? Give example.
16. 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 $\vec{A} + \vec{B}$.
17. Define One Newton.
18. How to reduce friction?

Part - III

III. Answer any 5 questions. (Q.No.24 is compulsory)

5 x 3 = 15

19. Check the correctness of the equation $\frac{1}{2}mv^2 = mgh$ using dimensional analysis method.
20. Write a note on triangulation method.
21. What are the limitations of dimensional analysis.
22. Show that the path of a projectile is a parabola.
23. Derive the relation between linear velocity and angular velocity.
24. A particle moves along the x-axis in such a way that its co-ordinates x-varies with time 't' according to the equation $x = 2 - 5t + 6t^2$. What is the initial velocity of the particle?
25. State and explain Lami's theorem.
26. Using free body diagram, show that it is easy to pull an object than to push it.

Part - IV

IV. Answer all the questions.

3 x 5 = 15

27. a) Write the rules for determining significant figures.
(OR)
b) Explain in detail the triangle law of Vector addition.
28. a) Derive the kinematic equations of motion for constant acceleration.
(OR)
b) Briefly explain the origin of friction. Show that in an inclined plane, angle of friction is equal to angle of repose.
29. a) State and prove the law of conservation of linear momentum.
(OR)
b) 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.
(k = 2π)
