XI- PHYSICS
Important questions

Unit 1:Nature of Physical World and Measurement

1. Write the rules for determining significant figures.
2. Write a note on triangulation method and radar method to measure larger distances.
3. Explain in detail the various types of errors.
4. What are the applications of dimensional analysis?

Unit 2 Kinematics

1. Explain in detail the triangle law of addition.
2. Discuss the properties of scalar and vector products.
3. Derive the expression for centripetal acceleration.

Unit 3 Laws of Motion

1. Using a free body diagram, show that it is easy to pull an object than to push it.
2. Explain the motion of blocks connected by a string in Horizontal motion.
3. State Newton's three laws and discuss their significance.
4. Explain the similarities and differences of centripetal and centrifugal forces.
5. Explain the need for banking of tracks.

Unit 4 Work, Energy and Power

1. Write the differences between conservative and Non-conservative forces. Give two examples.
2. Explain the characteristics of elastic and inelastic collision.
3. Explain with graphs the difference between work done by a constant force and variable force.
4. Arrive at an expression for power and velocity. Give some examples for the same.
5. Arrive an expression for elastic collision in one dimension and discuss various cases.

Unit 5 Motion of System of Particles and Rigid Bodies

1. Explain why a cyclist bends while negotiating a curved road? Arrive at the expression for angle of bending for a given velocity.
2. Derive the expression for moment of inertia of a rod about its centre and perpendicular to rod.
3. Derive the expression for moment of inertia of a uniform disc about an axis passing through the centre and perpendicular to the plane.
4. State and prove the parallel axis theorem.
5. State and prove perpendicular axis theorem.
6. Discuss rolling on an inclined plane and arrive at the expression for the acceleration.

Unit 6 Gravitation

1. State Newton's Universal law of gravitation.
2. Derive an expression for escape speed.
3. Explain the variation of g with depth from the Earth's surface.
4. Derive the time period of satellite orbiting the Earth.
5. Derive an expression for energy of satellite.

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Unit 7 Properties of matter

1. Explain the different types of modulus of elasticity.
2. Derive an expression for the elastic energy stored per unit volume of a wire.
3. Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using stokes force.
4. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.
5. Obtain an expression for the excess of pressure inside a i) liquid drop ii) soap bubble iii) air bubble.
6. What is capillarity? Obtain an expression for the surface tension of a liquid by capillary rise method.

Unit 8 Heat and thermodynamics

1. Explain in detail Newton's law of cooling.
2. Derive Mayer's relation for an ideal gas.
3. Derive the work done in an isothermal process.
4. Derive the work done in an adiabatic process
5. Derive the expression for Carnot engine efficiency.

Unit 9 Kinetic theory of gases

1. Write down the postulates of kinetic theory of gases.
2. Derive the expression of pressure exerted by the gas on the walls of the container.
3. Derive the ratio of two specific heat capacities of monoatomic, diatomic and triatomic molecules

Unit 10 Oscillations

1. State the laws of simple pendulum.
2. Write down the difference between simple harmonic motion and angular simple harmonic motion.
3. Discuss the simple pendulum in detail.
4. Discuss in detail the energy in simple harmonic motion.

Unit 11 Waves

1. Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace's correction.
2. Discuss the law of transverse vibrations in stretched strings.
3. Explain how overtones are produced in a Open organ pipe
4. Show that the velocity of a travelling wave produced in a string is $v = \sqrt{T/\mu}$

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