

XI PHYSICS

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Revise 'first' Questions for XI Class Annual Examinations**Page 1 of 2****Unit 1. Physical world & Measurements - 3 mark questions**

1. Define ampere.
2. Define the unit of length and time.
3. What is the principle of homogeneity of dimensions?
4. What are fundamental quantities? Write their units.
5. Distinguish between fundamental and derived quantities.
6. What are random errors? How they can be minimised?
7. What is light year? Write its value.
8. Why SI system is considered superior to other systems?
9. Write the unit & dimensional formula of the following:
 - i) gravitational constant
 - ii) impulse
 - iii) Magnetic induction
10. Check the equations dimensionally
 - a. $\text{Centripetal } F = \frac{mv^2}{r}$
 - b. $\text{displacement } s = at + \frac{1}{2} vt^2$
 - c. $\text{kinetic energy } E = \frac{1}{2} mv^2$

5 mark questions

1. Write the rules and conventions to be followed while writing S.I units.
2. Using dimensional analysis derive an equation for the time period of simple pendulum.
3. Write a short notes on various forces in nature.
4. What are the uses and limitations of dimensional analysis?

Unit 2. Kinematics - 3 mark questions

1. State triangle law of vector addition.
2. Define inertia & write its types with examples.
3. What is elastic & inelastic collisions? Give example.
4. Define : i) centripetal acceleration ii) centripetal force iii) centrifugal reaction
5. State i) work energy theorem. ii) Lami's theorem
6. Define impulse of a force write its unit.
7. Distinguish between conservative & non-conservative forces with examples.
8. What is angle of banking of tracks and write the conditions for skidding?
9. What are vector & scalar quantities? Give example.
10. Define i) Range of projectile ii) time of flight of projectile

5 mark questions

1. Show that the path of a projectile is a parabola.
2. State and explain Newton's laws of motion.
3. State and prove the law of conservation of linear momentum.
4. State and prove the work – energy theorem.
5. Derive an expression for kinetic energy.

10 mark questions

1. State and prove the parallelogram law of vectors. Discuss the special cases.
2. Obtain an expression for centripetal acceleration.
3. Explain the experimental verification of triangle law, parallelogram law and Lamis' theorem.
4. Derive the expressions for the velocities of bodies after the collision in the case one dimensional motion.

Unit 3. Rotational motion - 3 mark questions

1. State parallel axis theorem.
2. State perpendicular axis theorem.
3. State the law of conservation of momentum.
4. What are the types of equilibrium?
5. Define i) angular momentum ii) torque.
6. Define moment of inertia and write its unit & dimension.
7. What is radius of gyration? Write its unit.
8. Compare linear motion and angular motions.
9. Distinguish between centre of mass and centre of gravity.
10. What is a couple? Give examples.

5 mark questions

1. Show that the moment inertia of a rigid body is equal to twice the kinetic energy of rotation.
2. Obtain an expression for the angular momentum of a rigid body.
3. State and explain the law of conservation of angular momentum.

10 mark questions

1. Obtain an expression for position of centre of mass of two particle system.
2. Derive the equations of motion of rotational motion.
3. State and prove i) parallel axis theorem and ii) Perpendicular axis theorem.

Unit 4. Gravitation - 3 mark questions

1. State Newton's universal law of gravitation
2. Define gravitational potential at a point and gravitational field.
3. The moon has no atmosphere. Why?
4. Define i) escape speed ii) orbital velocity iii) gravitational constant
5. What are geostationary satellites?
6. What are the factors of 'g'? and derive the relation between 'g' and 'G'.
7. What are the conditions for a planet for the existence of life?
8. What is i) geo-centric theory and ii) helio-centric theory?
9. What are i) asteroids ii) constellations

10. What is 'albedo'?**5 mark questions**

1. State the Kepler's laws of planetary motion.
2. Write a note on milky way.
3. Define gravitational potential at a point and obtain an expression for it.
4. Discuss the various theories of origin of universe.

10 mark questions

1. What is escape speed? Derive an expression for it.
2. What is orbital velocity? Derive an expression for it.
3. Explain the variation of 'g' with respect to
 - i) altitude
 - ii) depth

Unit 5. Properties of matter - 3 mark questions

1. State i) Hooks's law.. ii) Pascal's law
2. What are cohesive and adhesive forces? Give examples.
3. What is Reynold's number? How the nature of flow is determined using this number.
4. What is surface tension? Write its unit & dimension.
5. Write any 3 applications of surface tension.
6. Define i) stress ii) strain and their units iii) elastic limit
7. Define i) Angle of contact ii) co-efficient of viscosity
8. State i) Stoke's law. ii) Pascal's law
9. Distinguish between streamlined and turbulent flow.
10. Moon has no atmosphere. Why?

5 mark questions

1. What is terminal velocity? Derive an expression for terminal velocity.
2. Obtain an expression for excess pressure inside a
 - i) liquid drop
 - ii) soap bubble
3. Establish the relation between surface tension and surface energy.
4. Derive the equation of continuity.

10 mark questions

1. Explain the three moduli of elasticity.
2. State and prove the 'Bernoulli's 'theorem'.
3. Explain the principle and working of
 - i) Hydraulic lift
 - ii) Hydraulic brake with diagram.

Unit 6. Oscillations - 3 mark questions

1. Define simple harmonic Motion and give examples.
2. What are the conditions for a motion to be simple harmonic?

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3. Define force constant & write its unit and dimension.
4. What is phase and phase difference of SHM?
5. What is an epoch or initial phase? Write its unit.
6. What are damped & undamped oscillations? Give example.
7. What are i) forced vibration ii) resonant vibration?
8. What are the advantages & disadvantages of resonance?
9. Give the graphical representation of
i) displacement ii) velocity iii) acceleration
10. What are coupled oscillations. Give examples.

5 mark questions

1. Obtain an expression for vertical oscillations of a loaded spring.
2. Derive an expression for total energy of a particle in SHM.
3. Obtain an expression for i) displacement
ii) velocity iii) acceleration in a simple harmonic motion
4. Show that the oscillation of a simple pendulum is SHM. Hence deduce an equation for the time period of simple pendulum.

Unit 7.Wave motion - 3 mark questions

1. What is Doppler effect? And write 3 applications of Doppler effect.
2. What are beats & write the conditions to get it.
3. Sound travels faster on rainy days. Why?
4. On what factors does the intensity of sound depends?.
5. What are i) stationary waves ii) progressive waves.
6. Show that $v = n\lambda$ for a wave motion.
7. Distinguish between transverse and longitudinal waves.
8. Define i) interference of waves ii) principle of superposition.
9. What are overtones and harmonics?
10. What is an echo? Why an echo cannot be heard in a small room?

5 mark questions

1. Define wave motion. Mention the properties of medium in which the wave propagates.
2. Show that the velocity of sound increases by 0.61 ms^{-1} for every degree of rise in temperature.
3. List out the differences between progressive & stationary waves?
4. Write a short note on whispering gallery.
5. State the laws of transverse vibration in a stretched strings

10 mark questions

1. Derive Newton's – Laplace formula for the velocity of sound in gases.

2. What is progressive wave? Obtain the equation for plane progressive waves?

Unit 8 .Heat & Thermodynamics - 3 mark questions

1. Define i) solar constant ii) absorptive power
iii) coefficient of thermal conductivity write its unit.
2. State i) Stefan's law ii) Kirchoff's law
3. What are degrees of freedom?
4. A heat engine with 100% efficiency is only theoretical possibility. Why?
5. Write the applications of Kirchoff's law.
6. Write the factors of coefficient of thermal conductivity..
7. State Wien's displacement law.
8. Define i) Clausius and ii) Kelvin's statements of II law of thermodynamics.
9. State the law of equipartition of energy.
10. Why C_p is always greater than C_v ?

5 mark questions

1. What are the postulates of kinetic theory of gases?
2. State and explain Zeroth, 1st and 2nd laws of thermodynamics.
3. What are the properties of thermal radiations?
4. Distinguish between reversible & irreversible processes with examples.

10 mark questions

1. Derive Victor-Mayer relation $C_p - C_v = R$.
2. State Newton's law of cooling. Explain the experimental verification of Newton's law of cooling.
3. Derive an expression for workdone in
i) an isothermal process. ii) adiabatic process

Unit 9 .Ray optics - 3 mark questions

1. Define power of a lens. Write its unit.
2. Define 'critical angle'.
3. What are the importances of velocity of light?
4. Distinguish between real and virtual images.
5. State the laws of i) reflection ii) refraction
6. Distinguish between primary & secondary rainbows.
7. What is total internal reflection? Write the conditions to get it.
8. What is magnification? Write the formula for magnification.
9. Write any 3 characteristics of image formation a plane mirror.
10. What are the important components of a spectrometer? Write the formula for the refractive index of a prism.

5 mark questions

1. Write a note on the formation of rainbows.
2. Explain the phenomenon of total internal reflection with diagram.
3. Write a note on optical fibres.
4. Write the Cartesian sign conventions.

10 mark questions

1. Explain Michelson method of determining the velocity of sound.
2. Derive Len's makers formula.
3. Derive the relation $\mu = \frac{\sin \frac{A+D}{2}}{\sin \frac{A}{2}}$ for a prism.
4. Define dispersive power of the material of the prism and obtain an expression for it.

Unit 10 .Magnetism - 3 mark question

1. State Tangent law
2. Define i) magnetic permeability ii) intensity of magnetisation
ii) magnetic susceptibility
3. State magnetic Coulomb's law.
4. What magnetic flux density. Write its unit.
5. What is curie temperature. Write its value for iron.
6. What is hysteresis in magnetism?
7. What are the elements of earth's magnetism?
8. Define i) declination ii) inclination
9. Define the angle of dip at a given place. Write its value on the equator.
10. What is tan A and tan B positions?

5 mark questions

1. Write the properties of magnetic lines of force.
2. Derive an expression for torque on a magnetic dipole placed in a uniform magnetic field.
3. Obtain an expression for magnetic induction at a point on the axial line of a bar magnet.
4. Obtain an expression for magnetic induction at a point on the equatorial line of a bar magnet.
5. State and prove tangent law.
6. Distinguish between para, dia and ferromagnetic materials with examples.

✓ No ten mark questions from the units 1,6 and 10.

✓ Read all the text back questions from for 1 mark questions.