

CLASS XII – PHYSICS

ANSWER KEY

(SET- 7)

SECTION A

MCQ Answers

1. (b) Constant
 2. (b) E^2
 3. (c) Right hand thumb rule
 4. (c) Lenz's law
 5. (b) 1
 6. (c) Length of tube
 7. (b) Frequency
 8. (b) Short range
 9. (a) L increases
 10. (b) 1
 11. (b) Equipotential surface
 12. (a) Number of nuclei
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Assertion–Reason Answers

13. Both A and R are true and R is correct explanation of A.
14. Both A and R are true and R is correct explanation of A.
15. Assertion is true but Reason is false.

16. Both A and R are true and R is correct explanation of A.

SECTION B

Q17. Electrostatic Potential Energy

Electrostatic potential energy is the work done in bringing a charge from infinity to a point in electric field.

$$U = qV$$

Q18. Motional EMF

When a conductor moves in magnetic field and cuts magnetic field lines, emf is induced.

$$E = Blv$$

Q19. Inductive Reactance

Inductive reactance is the opposition offered by inductor to AC current.

$$X_L = \omega L$$

Q20. Huygens' Principle

Each point on wavefront acts as a source of secondary wavelets.

Q21. Mass Defect

Mass defect is the difference between sum of masses of nucleons and actual mass of nucleus.

$$\Delta m = (Zm_p + Nm_n - m_{nucleus})$$

SECTION C

Q22. Torque on Electric Dipole

$$\tau = pE \sin \theta$$

Stable equilibrium when $\theta = 0^\circ$

Q23. Meter Bridge

Principle:

Based on Wheatstone bridge.

$$\frac{R}{X} = \frac{l_1}{l_2}$$

Q24. Magnetic Field Due to Solenoid

$$B = \mu_0 n I$$

Uniform inside solenoid.

Q25. Diffraction

Diffraction is bending of light around edges.

Condition for Maxima:

$$a \sin \theta = n \lambda$$

Q26. Impedance of Series LCR Circuit

$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

Q27. Dual Nature of Matter

de-Broglie equation:

$$\lambda = \frac{h}{p}$$

Shows matter has wave nature.

Q28. Half-Life and Decay Constant

$$T_{1/2} = \frac{0.693}{\lambda}$$

SECTION D

Q29. Electric Field

(a)

$$E = \frac{1}{4\pi\epsilon_0} \frac{q}{r^2}$$

(b) Electric flux:

$$\Phi = EA \cos \theta$$

(c) Field lines are radially outward for positive charge.

(d) Gauss's law:

$$\oint \vec{E} \cdot d\vec{A} = \frac{Q}{\epsilon_0}$$

Q30. Nuclear Fission

(a) Splitting of heavy nucleus into lighter nuclei.

(b) Chain reaction: Self-sustaining reaction.

(c) Moderator slows down neutrons.

(d) Control rods absorb excess neutrons.

SECTION E

Q31. Capacitance of Spherical Capacitor

$$C = 4\pi\epsilon_0 \frac{ab}{b-a}$$

Q32. Moving Coil Galvanometer

Torque:

$$\tau = nBIA$$

Deflection proportional to current.

Q33. Einstein's Photoelectric Equation

$$h\nu = KE_{max} + \Phi$$

Graph of KE vs frequency is straight line.

Slope = h
