CLASS XII – PHYSICS

ANSWER KEY

(SET- 10)

SECTION A

MCQ Answers

1. (c) $1/r^3$
2. (b) Double
3. (a) qvB
4. (b) Rate of change of flux
5. (b) Minimum
6. (b) Wavelength
7. (b) Increases
8. (c) Iron
9. (a) ½ CV^2
10. (b) 0.02 s
11. (b) Momentum
12. (c) $A^{1/3}$

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

SECTION B

Q17. Electric Potential

Electric potential at a point is defined as the work done in bringing a unit positive charge from infinity to that point.

$$V = \frac{W}{q}$$

SI Unit: Volt (V)

Q18. Lenz's Law

Lenz's law states that induced current flows in such a direction that it opposes the cause producing it.

Mathematically:

$$E = -\frac{d\Phi}{dt}$$

Negative sign indicates opposition.

Q19. Reactance

Reactance is the opposition offered by inductor or capacitor to alternating current.

$$X_L = \omega L$$
$$X_C = \frac{1}{\omega C}$$

Unit: Ohm (Ω)

Q20. Resolving Power of Telescope

Resolving power is the ability of telescope to distinguish two closely spaced objects.

$$RP = \frac{1}{\theta}$$

Q21. Half-Life

Half-life is the time required for half of the radioactive nuclei to decay.

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

SECTION C

Q22. Electric Field Due to Infinite Plane Sheet

Using Gauss's law:

$$E = \frac{\sigma}{2\varepsilon_0}$$

Q23. Charging of Capacitor Through Resistor

$$q = Q(1 - e^{-t/RC})$$
$$I = \frac{V}{R} e^{-t/RC}$$

Q24. Magnetic Field at Centre of Circular Coil

$$B = \frac{\mu_0 NI}{2R}$$

Q25. Young's Double Slit Experiment

Fringe width:

$$\beta = \frac{\lambda D}{d}$$

Q26. Average Power in AC Circuit

$$P = VI\cos\ \phi$$

Q27. Bohr's Postulates

Angular momentum:

$$mvr = \frac{nh}{2\pi}$$

Radius of nth orbit:

$$r_n = \frac{n^2h^2}{4\pi^2mke^2}$$

Q28. Radioactive Decay Law

$$N = N_0e^{-\lambda}$$
$$T_{1/2} = \frac{0.693}{\lambda}$$

SECTION D

Q29. LCR Circuit

(a) Resonance: $X_L = X_C$

(b)

$$f_0 = \frac{1}{2\pi\sqrt{LC}}$$

(c) Phase difference = 0°

(d) Current maximum

Q30. Nuclear Reactor

(a) Nuclear fission: Splitting of heavy nucleus.

(b) Chain reaction: Self-sustaining reaction.

(c) Moderator slows neutrons.

(d) Shielding prevents harmful radiation.

SECTION E

Q31. Electric Potential Due to Point Charge

$$V = \frac{1}{4\pi\varepsilon_0}\frac{q}{r}$$

Q32. Transformer

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

Works on electromagnetic induction.

Q33. Einstein's Photoelectric Equation

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

Explains particle nature of light.