

Roll No.....

Total No. of Questions : 22]

[Total No. of Printed Pages : 8

12thARF(S/Z)JD-2026

1420-A

PHYSICS – P₁

Time : 3 Hours]

[Maximum Marks : 70

SECTION-A

(Attempt all questions. Each part carries 1 mark.)

1. Choose Most Appropriate Answer : (10×1=10)

(i) The S.I Unit of electric flux is

(a) $\text{N-m}^2/\text{C}$

(b) Volt-metre

(c) Both of them

(d) None of them

- (ii) The magnetic force on a moving charge is maximum when angle between velocity vector and magnetic field is
- (a) 0° (b) π
 (c) 2π (d) $\pi/2$
- (iii) The inductance of a coil is directly proportional to
- (a) Length
 (b) Number of turns of coil
 (c) Resistance of coil
 (d) Square of number of turns of coil
- (iv) Henry is the S.I Unit of
- (a) Self-Inductance (b) Mutual Inductance
 (c) Both of them (d) None of them
- (v) The image formed by the objective of a compound microscope is
- (a) Real, inverted (b) Virtual, erect
 (c) Virtual, inverted (d) Real, erect

- (vi) What is the number of electrons in the nucleus of ${}_{92}\text{U}^{235}$?
- (a) Zero (b) 92
(c) 143 (d) 235
- (vii) Atomic radius depends upon the mass number A as
- (a) A^0 (b) A^1
(c) A^3 (d) $A^{1/3}$
- (viii) Lyman series lies in which of the following region of spectrum
- (a) Ultra Violet (b) Visible
(c) Infra-Red (d) None of them
- (ix) N-type extrinsic semi-conductor is
- (a) Negatively charged (b) Positively charged
(c) Electrically neutral (d) Pure semi-conductor

(x) The energy gap of Silicon is

(a) 1.1eV

(b) 1.1meV

(c) 0.76eV

(d) 0.76meV

SECTION-B

(Attempt all questions. Each question carries 02 marks.)

(9×2=18)

2. A wire of resistance 5Ω is stretched to double its original length, what is its new resistance?
3. Define resistance and resistivity. Write their S.I Units.
4. Define mean value of alternating current. Write the expression for mean value of a.c over a half cycle.
5. A capacitor of capacitance $1\mu\text{F}$ is connected to 50Hz a.c source. Find its capacitive reactance.
6. Define total internal reflection of light. Write the two conditions necessary for total internal reflection of light.

7. Define work function and threshold frequency. Give their S.I. Units.
8. Find the de Broglie wavelength of an electron accelerated through a potential difference of 100 eV.
9. Give two points of difference between nuclear fission and nuclear fusion.
10. Give four points of difference/similarity between p-type and n-type semi-conductor. <https://www.jkboseonline.com>

SECTION-C

(Attempt all questions. Each question carries 03 marks.)

(9×3=27)

11. Find the charge and energy stored in a capacitor of $5\mu\text{F}$ connected to a 50V source.
12. State and explain Kirchhoff's laws.

13. Give three properties of diamagnetic, para magnetic and ferro magnetic substance.

14. State and explain Faraday's laws of electromagnetic induction.

15. Give six properties of electromagnetic waves.

16. A ray of light suffers minimum deviation while passing through a prism of refractive index 1.5 and refraction angle of 60° . Find the angle of minimum deviation and angle of incidence.

17. What are coherent sources? Write four conditions for obtaining sustained interference of light.



18. Give three properties each of α , β and γ rays.

19. What is rectifier? How is Pn-junction diode used as a full wave rectifier?

SECTION-D

(Attempt all questions. Each question carries 05 marks.)

(3×5=15)

0. State Gauss's law of electrostatics. Find an expression for electric field due to infinitely long straight wire.

OR

Find an expression for the capacitance of a parallel plate capacitor in presence of dielectric slab between its plates.

21. State Biot Savart's law. Derive an expression for the magnetic field at the centre of circular coil carrying current.

OR

Give the principle, construction and working of moving coil galvanometer.

22. What is Lens Maker's formula? Derive an expression for Lens Maker's formula for a convex lens.

OR

State Huygen's Principle. Derive laws of reflection from Huygen's Principle.

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