

SUBJECT: PHYSICS

MAXIMUM MARKS: 70

CLASS: 12th

TIME: 3 HRS

S. No	General Instructions	Marks
	There are total of four sections in the question paper. All questions are compulsory.	
	Section- A contains 10 Very Very Short Answer Type Question of 1 Mark each	1x10 = 10 marks
	Section-B contains 9 Very Short Answer Type Question of 2 Marks each to be answered in 20 to 30 words.	2x9 = 18 marks
	Section-C contains 9 Short Answer Type Questions of 3 Marks each to be answered in 50 to 70 words	3x9 = 27 marks
	Section-D contains 3 Long Answer Type Questions of 5 Marks each to be answered in 100 to 150 words.	5X3 =15 marks
2	Use log table, if necessary. Use of scientific calculator is not allowed	

SECTION A

Q.1.

(i) The magnitude of elementary charge is

- (a) 2×10^{-19} C (b) 1.6×10^{-19} C
(c) Zero (d) infinity

(ii) The resistance of a wire is R if the length of the wire is doubled, then its resistance will be

- (a) 2R (b) 4R
(c) R (d) 0.25 R

(iii) Tesla is the unit of

- (a) electric flux (b) magnetic flux
(c) electric field (d) magnetic field

(iv) The frequency of house hold supply of AC in India is

- (a) 60 Hz (b) 100 Hz
(c) 50 Hz (d) 70 Hz

(v) The speed of electromagnetic waves is independent of

- (a) wavelength (b) frequency
(c) intensity (d) medium, in which they travel



Q10. Differentiate between P-type and N-type semiconductor.

SECTION C

Answer the following questions:

Q11. A sphere of radius 10 cm has an unknown charge. If the electric field, 10 cm from the center of the sphere is 2.0×10^4 N/C and points radially inward, what is the net charge on the sphere?

Q12. No two electric lines of force can cross each other. Explain with diagram.

Q13. State Ohm's law and derive the relation $J = \sigma E$

Q14. With the help of Kirchhoff's rule, obtain the condition for balancing of a Wheatstone Bridge.

Q15. State Biot-Savart law. Derive an expression for the magnetic field at a point on the axis of a circular coil.

Q16. What is a.c. generator? State its principle and name the main components of a.c. generator.

Q17. What are coherent sources? Why two independent sources cannot be coherent?

Q18. Derive relationship for magnifying power of a telescope in normal adjustment?

Q19. What is nuclear fission? Give an example to illustrate it. What is the importance of fission phenomenon?

SECTION D

Answer the following questions:

Q20. What are dia, para, and ferromagnetic materials? Discuss their important properties.

OR

Using Ampere's circuit law, derive an expression for magnetic field due to infinitely long straight conductor.

Q21. State and explain Faraday's laws of electromagnetic induction. Show that $E = -d\phi/dt$

OR

At a power plant, the water head is at a height of 100 m and water flow available is $300 \text{ m}^3/\text{s}$. If the efficiency is 60%, find the electric power available from the plant.

Q22. What is optical fiber? Discuss how it is used to transmit light beam from one place to another without the loss in intensity of light? What are its other uses?

OR

State Huygens's principle. With the help of this principle derive the laws of refraction.

