

MODEL QUESTION PAPER
PHYSICS
XII – STANDARD (STATE BOARD)

Time: 3 Hours

Max. Marks: 70

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Blue (or) Black ink to write and underline use pencil to draw diagrams. Note: Draw diagrams and write questions wherever necessary.

PART – I

Note: 1. Answer all the questions.

15×1=15

2. Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1	Which charge configuration produces a uniform electric field? a) Uniform charged Infinite Plan b) Point Charge c) Uniformly charged spherical shell d) Uniformly charged infinite line	1
2	The blue print for making ultra durables synthetic material is mimick from a) Parrotfish b) Lotus leaf c) Peacock feather d) Morpho butterfly	1
3	Which of the following false for electromagnetic waves a) Longitudinal b) Transverse c) Produced by accelerating charges d) Non-Mechanical waves	1
4	The zenerdiode is primarily used as a) Oscillator b) Rectifier c) Voltage Regulator c) Amplifier	1
5	Stars twinkle due to, a) Reflection b) Total internal reflection c) Refraction d) Polarisation	1
6	If the velocity and wavelength of light in air is V_a and λ_a and that in water is V_w and λ_w , then the refractive index of water is, a) $\frac{V_w}{V_a}$ b) $\frac{V_a}{V_w}$ c) $\frac{\lambda_w}{\lambda_a}$ d) $\frac{V_a \lambda_a}{V_w \lambda_w}$	1

7	For healthy eye the distance of the near point is (A) 30 cm b) 20 cm c) 35cm d) 35cm	1
8	The internal resistance of a 2.1 V cell which gives a current of 0.2A through a resistance of 10 Ω is. a) 0.8 Ω b) 0.2 Ω c) 1.0 Ω d) 0.5 Ω	1
9	The transverse nature of light is shown in, a) Interference b) Diffraction c) Scattering d) Polarisation	1
10	Two coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are a) 5I and I b) 5I and 3I c) 9I and I d) 9I and 3I	1
11	Emission of electrons by the absorption of heat energy is called _____ emission a) Photoelectric b) Field c) Thermionic d) Secondary	1
12	Which of the following materials affects the angle of polarization? a) Water b) Air c) Vaccum d) Glass	1
13	In a young's double slit experiment the slit separation is doubled. To maintain the same fringes pacing on the screen, the screen to slit distance D must be changed to a) $\sqrt{2}D$ b) 2D c) $D/\sqrt{2}$ d) D/2	1
14	Which of the following statements about Fraunhofer lines is correct? a) They are bright lines in the solar spectrum b) They are caused by emission of light from the sun c) They result from the absorption of specific wavelengths by elements in the Sun's atmosphere. d) They are only visible with a telescope.	1
15	What happens to the angle of polarization when light passes from a medium with a lower refractive index to a medium with a higher refractive index? a) Increases b) Decreases c) Remains the same d) Depends on the wavelength	1

PART - II

Answer any six questions. Question No. 24 is Compulsory.

6×2=12

16	Mention the ways of producing induced emf	2
17	Find the polarizing angle for glass of refractive index 1.5	2
18	What is peltiere effect?	2
19	Define “Electrostatic Potential”	2
20	How will you define threshold frequency	2
21	State ampere’s circuit law	2
22	Why does sky appear blue?	2
23	Give two uses of IR radiation	2
24	Dielectric strength of air is $4 \times 10^6 \text{ V m}^{-1}$. Suppose the radius of a hollow sphere in the Van de Graaff generator is $R=0.4 \text{ m}$, calculate the maximum potential difference created by this Vande Graaff generator	2

PART – III

Answer any six questions. Question No. 33 is compulsory.

6×3=18

25	State Kirchhoff’s current and voltage rule	3
26	What are critical angle and total internal reflection	3
27	List out characteristics of photons	3
28	Obtain the expression for energy stored in the parallel plate capacitor	3
29	Mention the difference between interference and diffraction	3
30	There pulsive force between two magnetic poles in air is $9 \times 10^{-3} \text{ N}$. If the two poles are equal in strength and are separated by a distance of 10 cm, calculate the pole strength of each pole	3
31	Draw the circuit diagram of a full wave rectifier and draw its input and output waveforms.	3
32	Mention the various energy losses in a transformer.	3
33	${}_{92}\text{U}^{235}$ nucleus emits 2 α particles, 3 β particles and 2 γ particles. What is the resulting atomic number and mass number?	3

PART - IV

Answer all the following questions.

5×5=25

34	a) Deduce the relation for the magnetic field at a point due to an infinitely long straight conductor carrying current (OR) b) Obtain the law of radioactivity.	5
35	a) Calculate the electric field due to a dipole on its axial line. (OR) b) What is Frequency Modulation? List out the advantages and limitations of frequency modulation.	5
36	a) i) Derive an expression for de-Broglie wavelength of electrons. ii) Calculate the momentum of an electron with kinetic energy 2eV. (OR) b) Write down Maxwell equations in integral form.	5
37	a) Explain about Astronomical telescope and obtain the equation for the magnification. (OR) b) A Copper wire of cross-sectional area 0.5mm^2 carries a current of 0.2A. If the free electron density of copper is $8.4 \times 10^{28}\text{m}^{-3}$ then compute the drift velocity of free electrons	5
38	a) Obtain Lens maker's formula. (OR) b) Derive an expression for phase angle between the applied voltage and current in a series RLC circuit.	5