

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	The ration between the radius of first three orbits of hydrogen atom is a) 1:2:3 b) 1:2:2 c) 1:4:9 d) 1:3:5	1
2	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
3	A wire connected to a power supply of 230 V has power dissipation P_1 . Suppose the wire is cut into two equal pieces and connected parallel to the same power supply In this case power dissipation is P_2 . The ratio P_2/P_1 is a) 1 b) 2 c) 3 d) 4	1
4	Fraunhofer lines are an example of _____ spectrum a) line emission b) line absorption c) band emission d) band absorption	1
5	Stars twinkle due to, a) Reflection b) Total internal reflection c) Refraction d) Polarisation	1
6	The Temperature co-efficient of resistance of a wire is 0.00125 per $^{\circ}C$. At $20^{\circ}C$, its resistance is 1Ω . The resistance of the wire will be 2Ω at. a) $800^{\circ}C$ b) $700^{\circ}C$ c) $850^{\circ}C$ d) $820^{\circ}C$	1
7	The value of L,C and R of an AC circuit are 1 H, 9 F and 3Ω respectively. The quality factor for this circuit is a) 1 b) 9 c) 1/9 d) 1/3	1

8	<p>The threshold wavelength for a metal surface whose photoelectric work function is 3.313eV is</p> <p>a) 4125A° b) 3750A° c) 6000A° d) 20625A°</p>	1
9	<p>A circular coil of radius 5 cm and 50 turns carries a current of 3 ampere. The magnetic dipole moment of the coil nearly</p> <p>a) 1.0 Am² b) 1.2 Am² c) 0.5 Am² d) 0.8 Am²</p>	1
10	<p>Two radiation with photon energies 0.9ev and 3.3ev respectively fall on a metallic surface successively. If the work function of the material is 0.6ev, then the ratio of maximum speed of emitted electrons in the two cases will be</p> <p>a) 1:4 b) 1:3 c) 1:1 d) 1:9</p>	1
11	<p>The mass of a ${}^7_3\text{Li}$ nucleus is 0.042u less than the sum of the masses of all its nucleons. The average binding energy per nucleon of ${}^7_3\text{Li}$ nucleus is nearly</p> <p>a) 46Mev b) 5.6 Mev c) 3.9 Mev d) 23 Mev</p>	1
12	<p>If a positive half wave rectified is fed to a load resistor, for which part of a cycle of the input signal there will be current flow through the load?</p> <p>a) 0° – 90° b) 90° – 180° c) 0° – 180° d) 0° – 360°</p>	1
13	<p>If the mean wavelength of light from the sun is taken as 550nm and its mean power as 3.8×10^{-26} W then, the average number of photons received by the human eye per second from sunlight is of the order of</p> <p>a) 10^{45} b) 10^{42} c) 10^{54} d) 10^{51}</p>	1
14	<p>The particle size of ZNO material is 30 nm based on the dimension it is classified as</p> <p>a) Bulk material b) Nano material c) Soft material d) Magnetic material</p>	1
15	<p>Emission of electrons by the absorption of heat energy is called _____ emission</p> <p>a) Photoelectric b) Field c) Thermionic d) Secondary</p>	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	Define stopping potential	2
18	Give two uses of UV radiation	2
19	Pure water refractive index 1.33 what is the speed of light through it?	2
20	Define ampere in terms of force	2
21	What is rectification	2
22	A proton and an electron have same Kinetic energy. Which one has greater de Broglie wavelength justify	2
23	State Gauss law	2
24	Define atomic mass unit	2

PART - III

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

6×3=18

25	Obtain an expression for energy stored in the parallel plate capacitor	3
26	An electron moving perpendicular to a uniform magnetic field 0.500 T undergoes circular motion of radius 2.50 mm. What is the speed of electron?	3
27	Give the construction and working of a photo emissive cell	3
28	Mention the differences between interference and diffraction	3
29	What is Zener diode? Mention any two uses of Zener diode	3
30	What is seeback effect? State the application of seeback effect	3
31	What are the properties of cathode rays?	3
32	AC is advantageous than DC. Explain	3
33	Light travel from air into a glass slab of thickness 50cm and refractive index 1.5. What is the speed of light in the glass slab and what is the time taken by the light to travel through the glass slab?	3

PART - IV

Answer all the following questions.

5×5=25

34	a) Obtain the condition for bridge balance in wheatstone's bridge (OR) b) i) What is half life and mean life of radioactive nucleus? ii) Calculate the number of nuclei of carbon -14 undecayed after 22,920 years if the initial number of carbon 14 atoms in 10,000. The half life of carbon 14 is 5730 years.	5
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35	<p>a) Describe the Fizeau's method to determine speed of light</p> <p style="text-align: center;">(OR)</p> <p>b) i) write down the properties of electromagnetic waves ii) The relative magnetic permeability of the medium is 2.5 and the relative electrical permittivity of the medium is 2.25. Compute the refractive index of the medium.</p>	5
36	<p>a) Explain in detail the construction and working of a Van de Graff generator</p> <p style="text-align: center;">(OR)</p> <p>b) Explain about compound microscope and obtain the equation for magnification</p>	5
37	<p>a) Show that the mutual inductance between a pair of coil is same ($M_{12} = M_{21}$)</p> <p style="text-align: center;">(OR)</p> <p>b) State and prove De Morgan's first and second theorem</p>	5
38	<p>a) i) Obtain the Einstein's photoelectric equation with necessary explanation ii) List out the characteristics of photons.</p> <p style="text-align: center;">(OR)</p> <p>b) Derive the expression for the force on a current carrying conductor in a magnetic field</p>	5