# 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.

 $15 \times 1 = 15$ 

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

	Which one of the following is the natural nanomaterial?	<b>)</b>	
1	a) Grain of sand b) Peacock feather	1	L
	c) Skin of the whale d) Peacock beak		
	In an electron microscope, the electrons are accelerated be ky the voltage is changed to 224 ky, then the de-Broassociated with the electron would	-	
2	a) Decrease by 4 times b) Increase by 2 times	1	
	c) Increase by 4 times d) Decrease by 2 times		
	The variation of frequency of carrier wave with respect to amplitude of the modulating signal is called	the instantaneous	
3	a) Phase modulation b) Amplitude modulation	1	:
	c) Pulse width modulation d) Frequency modulation		
	Q factor is equal to		
4	a) $\frac{\omega_r L}{R}$ b) $\frac{1}{R} \sqrt{\frac{L}{C}}$ c) $\frac{X_L}{R}$ c) All the	above 1	

	Two metallic spheres of radii 1cm and 3cm are given charges of -1x 10 <sup>-2</sup> C	
5	and 5x10 <sup>-2</sup> C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is	1
	a) $1 \times 10^{-2} \text{ C}$ b) $3 \times 10^{-2} \text{ C}$ c) $2 \times 10^{-2} \text{ C}$ d) $4 \times 10^{-2} \text{ C}$	
6	Which of the following is an electromagnetic wave? a) $\beta$ - rays b) $\gamma$ - rays c) $\alpha$ - rays d) All of the above	1
7	An air bubble in glass slab of refractive index 1.5 (near normal incidence) is 5 cm deep when viewed from one surface and 3cm deep when viewed from the opposite face. The thickness of the slab is a) 12 cm b) 8 cm c) 16 cm d) 10 cm	1
8	In India electricity is supplied for domestic use at 220 V. It is supplied at 110 V in USA. If the resistance of a 60 W bulb for use in India is R, the resistance of a 60 W bulb for use a) R/4 b) R c) R/2 d) 2R	1
	A wire of length 1 carrying a current I along the Y direction is kept in a magnetic field given by $\overrightarrow{B} = \frac{\beta}{\sqrt{3}} (\hat{\imath} + \hat{\jmath} + \hat{k})T$ . The magnitude of Lorentz	
9	force acting on the wire is:	1
	a) $\sqrt{2} \beta Il$ b) $\sqrt{\frac{2}{3}}\beta Il$ c) $\sqrt{\frac{1}{2}}\beta Il$ d) $\sqrt{\frac{1}{3}}\beta Il$	
10	Emission of electron by the absorption of heat energy is called emission a) Thermionic b) Photo electric c) Secondary d) Field	1
	If a current of 7.5 A is maintained in a wire for 45 seconds then the charge flowing through the wire is	
11	a) 6C b) 365.5 C c) 3C d) 337.5 C	1
	The charge of cathode ray is	_
12	a) Neutral b) Positive c) Not defined d) Negative	1
	A step-down transformer reduces the supply voltage from 220 V to 11 V and increases the current from 6 A to 100 A. Then its efficiency is:	
13	a) 0.12 b) 1.2 c) 0.9 d) 0.83	1

	14	The electric potential of an electron is given by $V = V_0 \ln \left(\frac{r}{r_0}\right)$ , Where ro is a constant. If Bohr atom model is valid, then variation of radius of n <sup>th</sup> orbit rn with the principal quantum number n is  a) $rn \alpha \frac{1}{n^2}$ b) $rn \alpha \frac{1}{n}$ c) $r_n \alpha n^2$ d) $r_n \alpha n$	1
		Transverse nature of light is shown in	
	15	a) Scattering b) Interference c) Polarisation d) Diffraction	1

# $$\operatorname{\textbf{PART}}$ - II Answer any six questions. Question No. 24 is Compulsory.

6×2=12

16	What is corona discharge?	2
17	How will you increase the current sensitivity of a galvanometer	2
18	Define work function of a metal. Mention its unit	2
19	Calculate the radius of $^{197}_{79}Au$ nucleus	2
20	State Fleming's right hand rule.	2
21	What do you mean by doping?	2
22	What is displacement current?	2
23	Define electrical resistivity	2
24	The angle of minimum deviation for the equilateral prism is 40°. Find the reractive index of the material of the prism.	2

## PART – III

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

 $6 \times 3 = 18$ 

25	Derive the relation between f and R for a spherical mirror.	3
26	Obtain a relation between current and drift velocity	3
27	List out the laws of Photo electric effect.	3
28	Draw the circuit diagram of NPN transistor in Common Emitter Configuration.	3
29	Give the uses of Polaroids.	3

30	Derive the expression for resultant capacitance	3
31	Find the : i] Angular momentum ii] Velocity of the electron revolving in the $5^{th}$ orbit of hydrogen atom. [h = $6.6 \times 10^{-34}  \text{Js}$ ; m = $9.1 \times 10^{-31}  \text{kg}$ ]	3
32	List out salient features of magnetic Lorentz force.	3
33	Find the impedance of a series RLC circuit, if the inductive reactance, capacitive reactance and resistance are 184 $\Omega$ , 144 $\Omega$ and 30 $\Omega$ respectively. Also calculate the phase angle between voltage and current.	3

## PART - IV

## Answer all the following questions.

5×5=25

	a) Explain the construction and working of full wave rectifier	
34	(OR)	5
	b) Explain the construction and working of transformer.	
	a) Derive an expression for electrostatic potential due to an electric dipole.	
35	(OR)	5
	b) Obtain the equation for bandwidth in Young's Double Slit Experiment.	
	a) Using Bio-Savart law deduce the relation for the magnetic field at a point due to an infinitely long straight conductor carrying current.	
36	(OR)	5
	b) Discuss the spectral series of hydrogen atom	
	<ul> <li>a) i) How do we obtain characteristic X – ray spectra?</li> <li>ii) Calculate the cut-off wavelength and cut-off frequency of X-rays from an X – ray tube of accelerating potential 20,000 V.</li> </ul>	
37	(OR)	5
	b) What is spectrum? Explain the types of emission spectrum.	
	a) Obtain Lens maker's formula (OR)	
38	b) Explain the determination of the internal resistance of cell using voltmeter.	5