ANSWER KEY

SECOND YEAR HIGHER SECONDARY SAY/IMPVT EXAMINATION

JUNE 2023

S2224

SUBJECT : PHYSICS

CODE. NO: ~~SY224~~

60 SCORES

2 HOURS

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
1.		Quantisation	1	
2.		Lenz's law	1	
3.		In the electric field between the plates.	1	
4.		Self inductance / Self induction	1	5
5.		Any Answer	1	
6.		Work function / Threshold Energy	1	
7.		Interference	1	
8.		Diagram showing the force.	1	2
		final Equation / $\vec{\tau} = \vec{P} \times \vec{E}$	1	
9.	a.	Zero	1	2
	b.	Diagram.	1	
10.	a.	Statement / Equation.	1	2
	b.	$I = nAeV_d$.	1	
11.	a.	Semi conductor	1	2
	b.	$\rho = \frac{m}{ne^2\tau}$	1	
12.	a.	Microwaves	½	2
	b.	Infrared rays	½	
	c.	U.V rays	½	
	d.	γ - rays.	½	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
13.		$f = \frac{-15}{2} = -7.5$ cm, $u = -10$ cm $\frac{1}{v} + \frac{1}{-10} = \frac{1}{-7.5}$, $v = -30$ cm $m = -\frac{v}{u} = -\left(\frac{-30}{-10}\right) = -3$ OR $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ 1 Score.	2	2
14.		$X_L = L\omega$ $X_C = \frac{1}{C\omega}$	1 1	2
15	a.	Statement of Junction Rule and Loop Rule OR $\Sigma I = 0$ 1 Score $\Sigma IR = E$ 1 Score.	1+1	3
	b.	Diagram.	1	
16.	a.	True	1	3
	b.	Definition OR $F = \frac{\mu_0 I_1 I_2}{2\pi r}$ 1 Score.	2	
17.	a.	Electromagnetic induction.	1	3
	b.	Derivation of $\mathcal{E} = \mathcal{E}_0 \sin\omega t$ OR. $E = -\frac{d\phi}{dt}$ ($\frac{1}{2}$ Score), $\phi = NAB\cos\omega t$ ($\frac{1}{2}$ Score) Final Equation. 1 Score.	2	
18.	a.	Statement	2	3
	b.	Explanation of Coherent Source.	1	

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19.	a.	Equation.	1	3
	b.	$E = h\nu = 6.63\times10^{-34} \times 6\times10^{14} = 3.98\times10^{-19}$ J $N = \frac{P}{E} = \frac{2\times10^{-3}}{3.98\times10^{-19}} = 5\times10^{15}$ Photons. OR $E = h\nu$ (1 score) / final Answer (1 score)	2	
20.	a.	Two observations / conclusion	2	3
	b.	Definition	1	
21.	a.	Statement / $\Delta m = [Z m_p + (A-Z) m_n - M]$	1	3
	b.	Expression. / $B.E = \Delta m c^2$	1	
	c.	F_e	1	
22.	a.	Bismuth	1	4
	b.	Statement of Sucsptibility, $\chi >> 1$	1+1	
	c.	Move from stronger to weaker magnetic field	1	
23.	a.	Increase or decrease Voltage	1	4
	b.	Step up, Step down	1	
	c.	Explain any two methods	2	
24.	a.	Diagram Derivation $A = r_1 + r_2$ 1 score $d = i_1 + i_2 - A$ 1 score $n = \frac{\sin\left(\frac{A+D}{2}\right)}{\sin\left(\frac{A}{2}\right)}$ 1 score. OR $n = \frac{\sin i}{\sin r}$ 1 score.	1 3	4

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
25.	a.	Diagram and Working Input and out put wave form (1 Score)	1+2	4
	b.	100Hz	1	
26.	a.	Derivation out side the Shell OR $\Phi = \frac{1}{\varepsilon_0} q$ 1 Score figure 1 Score $E = \frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}$ / $E = \frac{\sigma R^2}{\varepsilon_0 r^2}$ 1 Score.	3	5
	b.	$E = \frac{\sigma}{\varepsilon_0}$ / $E = \frac{1}{4\pi\varepsilon_0}\cdot\frac{q}{R^2}$	1	
	c.	$E = 0$	1	
27.	a.	Any Two factors. (½ each.)	1	5
	b.	Derivation, figure 1 Score $Q = CV$ 1 Score $\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$ 1 Score	3	
	c.	Increases	1	
28.	a.	Derivation OR. $dB = \frac{\mu_0 I dl \sin\theta}{4\pi} \frac{}{r^2}$ 1 Score. Final Equation 1 Score. OR frg: only 1 Score.	3	5
	b.	$B = \frac{\mu_0 NI}{2R} = \frac{4\pi\times10^{-7}\times10^{-2}\times1}{2\times10^{-1}} = 6.28\times10^{-6}$ OR Eqn only 1 Score. Final Answer 1 Score	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
29.	a-	Ratio of angle β subtended at the eye by the final image to the angle α which the object subtend at the lens or the eye. $(m = \beta/\alpha = f_o/f_e$ OR $m = v/u$ ($\frac{1}{2}$ Score)	2	5
	b.	$f_o + f_e$	1	
	c.	Any two advantage (1+1)	2.	

1.	Sebastian Mathew		9447521892
2.	Vinil Kumar. T		9447183149
3.	SUDHEER. CV		9495707565
4.	MUHAMMED IRSHAD. P		9447793915
5.	Lekha. C. L		9495483396
6.	Dr. Renjith JS		9447354328
7.	Harikrishnan. IC		9645036985
8.	Amrutha Hari. S.		9446347460
9.	LEENA PHILIP		9497615905
10.	Premalatha. K.		6282606979
11	JOSE WILFRED		9447451163
12	SHANTY M. THOMAS		9495828164