ANSWER KEY

SECOND YEAR HIGHER SECONDARY EXAMINATION MARCH 2025

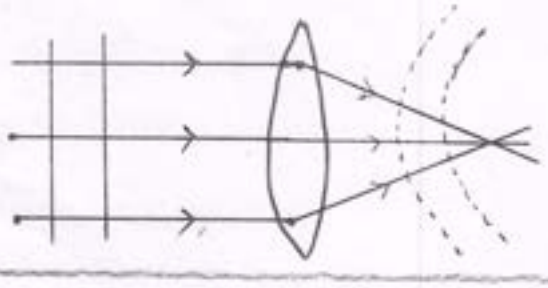
PART-I/II/III

SUBJECT: PHYSICS

CODE NO: SY 424 VERSION: P

60 SCORES 2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1.		c) Electric field	1	1.
2.		Zero	1	1.
3.		ii) Lenz's Law.	1	1.
4.		ii) $\nu_1 > \nu_3 > \nu_2$.	1	1
5.		$4 r_0$	1	1
6.		0.5m	1	1
7.		Nuclear fusion.	1	1.
8.		$I = neAv_d$ (½ Score) $v_d = \frac{Ee}{m}\tau$ (½ Score) $I = ne A \frac{Ee}{m}\tau$, $E = \frac{V}{l}$ (½ Score) $I = ne^2 A \frac{V}{lm}\tau$. (½ Score) $R = \frac{V}{I} = \frac{lm}{ne^2 A\tau}$. OR $\frac{V}{I} = R$ — (½)	2.	2.
9.		Diamagnetic	1.	2.
		$\mu_r = 1 + \chi_m$	1	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
10.	a.	$\pi/2$.	1.	
	b.	Zero.	1.	2.
11.	a.	Radio waves	1.	
	b.	iii) $\varepsilon_0 \frac{d\Phi_E}{dt}$	1.	2.
12.	a.	Definition	1.	
	b.		1	2.
13.		Ionisation energy - definition	1	
		13.6 eV	1	2.
14.		$\Delta m = [Z m_p + (A-Z) m_n] - M$. (½ score)		
		$= [6 \times 1.007825 + 6 \times 1.008665] -$ 12.000000 (½ score)	2	2
		$E = \Delta m \times 931$ MeV (½ score)		
		final answer – ½ score (92.11 MeV)		
15	a.	Definition/Equation	1.	
	b.	$\vec{\tau} = \vec{P} \times \vec{E} / PE \sin\theta$ (1 score) $\theta = 90^\circ$ or $\frac{\pi}{2}$ (1 score)	2	3
16.	a.	Definition	1	
	b.	Two properties (1 score each)	2.	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
17.	a.	Principle	1.	
	b.	by connecting shunt resistance parallel to the galvanometer / figure.	1.	
	c.	Current remains same in series connection and also resistance of ammeter is very small due to which it doesnot effect the current.	1	3.
18.		figure (1 score) Derivation. (2 score) OR final equation only ½ score.		3.
19.	a.	iii) 	1.	
	b	Equation – 1 score Substitution, final answer (½ each)	2	3
20	a.	Statement or equation	1.	
	b.	$\tau = m B \sin\theta$ (1 score) $m = \frac{\tau}{B \sin\theta} = \frac{5 \times 10^{-2}}{0.3 \times \sin 30}$ (½ score) $= 0.33\ Am^2$ (½ score)	2	3
21.		Explain working. (1 score) Circuit diagram (1 score) Wave form (input and output) (½ score each)	1 1 1	3.

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
22.	a.	Derivation (2 score) OR fig only ½ score, final equation ½ Score	2	
	b.	$C = \frac{\varepsilon_0 A}{d}$ A greater for C_2 $\therefore C_2 > C_1$ (½ Score) slope of X > slope of Y (½ Score) C of X is greater than Y (½ Score) Then Y corresponds to C_1 (½ Score) OR Y (1 score), Correct explanation (1 score)	2.	4.
23.	a.	ii) Energy	1.	
	b.	Diagram - 1 Score Derivation - 2 Score. OR Final Equation only ½ Score	3	4.
24.	a.	Electromagnetic Induction. (1 Score)	1.	
	b.	Diagram - 1 Score. Theory and Working. } (2 Score)	3	4
25.	a.	Ray diagram. - (2 Score)	2.	
	b.	$m = 20$. $f_e = 5\text{ cm.} = 5\times10^{-2}\text{ m.}$ $D = 25\times10^{-2}\text{ m.}$ $m_o = ?$. $m_e = 1 + \frac{D}{f_e} = 1 + \left(\frac{25\times10^{-2}}{5\times10^{-2}}\right)$. (1 Score) $= \underline{\underline{6}}$	2.	4.
		$m \neq m_o m_e$ (½ Score) $m_o = \frac{m}{m_e} = \frac{20}{6} = \underline{\underline{3.33}}$ (½ Score)		

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
26.	a.	(i) Derivation · 2 score (ii) equation 1 score	3.	
	b.	(i) flux, $\phi = \frac{q}{\varepsilon_0}$ · (½ Score) or $q = \phi \varepsilon_0 = -2\times10^{14} \times 8.85\times10^{-12}$ (½ Score) $= -17.7\times10^{2}\,C$ $= -1.77\times10^{3}\,C$	1.	5
		(ii) Same or $-2\times10^{14}\,Nm^2/C$ Independent of or Nedin of the Gaussian Surface.	1.	
27.	a	Definition / equation	1.	
	b.	(i) Irdly outwards / $\vec{v} \perp \vec{B} / \theta = 90^\circ$	1	
		(ii) $Bqv = \frac{mv^2}{r}$ (½ Score) $\frac{v}{r} = \omega = \frac{Bq}{m}$ (½ Score) $2\pi\nu = \frac{Bq}{m}$ (½ Score) $\nu = \frac{Bq}{2\pi m}$ (½ Score) OR. If first two equations are correct give full score	2.	5
		(iii) No (½ score), Circular motion K.E of charged particle is constant. Magnetic force acting on the particle is ⊥ to velocity. (½ Score)	1.	
28.	a.	Phasor diagram (1 score) Impedance derivation (2 score) OR final equation only (1 score)	3	5
	b.	$\nu = \frac{1}{2\pi\sqrt{LC}}$, (½ score) Substitution, final answer (½ score) (½ score)	2	
29.	a.	Diagram with proper marking	2.	
	b	$A+d = i_1+i_2$, derivation	2	5
	c.	Angle of minimum deviation - definition OR i-d curve graph	1	

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