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ANSWER KEY

Second YEAR HIGHER SECONDARY EXAMINATION ..... March... 2024

PART-I/II/III

SUBJECT: ..... PHYSICS .....

CODE NO: S.Y.524

VERSION: T

60 SCORES

2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
Section - A				
1		(c) $Nm^2c^{-1}$		1
2		(a) zero		1
3		(d) D		1
4		True		1
5		$\lambda = \frac{h}{p} = \frac{h}{mv}$ or $\lambda = \frac{h}{\sqrt{2mK}} = \frac{h}{\sqrt{2mE}}$		1
6		Iron or Fe or ${}_{26}^{56}\text{Fe}$ or ${}^{56}\text{Fe}$		1
7		Semiconductor in its pure form		1
Section - B				
8		A surface which has same potential everywhere. (1 score) eg:- Any suitable example/figure/equation (1 score)		2
9		Definition (1 score) $V_d = \frac{eE}{m} \tau$ (1 score) or $V_d = \frac{I}{nAe}$ or $\frac{j}{ne}$ or $I = nAV_d e$		2

Qr. No	Sub Qns	Answer Key/Value Points	Score	Total Score
10		Statement / equation		2
11		Definition or equation		2
12		$V_{rms} = \frac{V_m}{\sqrt{2}} = \frac{V_0}{\sqrt{2}}$ $V_m = V_{rms} \times \sqrt{2} \quad (1 \text{ Score})$ $V_m = 220 \times 1.414 = 311 \text{ V} \quad (1 \text{ Score})$		2
13		Definition / explanation / correct graph		2
14		Definition / explanation (1 Score) suitable example (1 Score)		2
15		Section - C  Statement of Coulomb's law (2 Score) Equation (1 Score) or Like charges repel and unlike charges attract (1/2 Score)		3
16		Derivation of $F = \frac{\mu_0}{4\pi} \frac{2 i_1 i_2 L}{d}$ $= \frac{\mu_0 i_1 i_2 L}{2\pi d}$ or		3










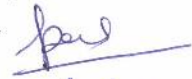
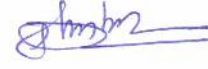


Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		Equation of magnetic field (1 Score) Equation of force (1 Score) Final equation (1 Score)		
17.		Comparison or figure with one example each		3
18.		Definition of Self Induction (1½ Score) Definition of Self Inductance or equation (1½ Score)		3
19		Explanation or electromagnetic waves in an order		3
20		Three Postulates (1 Score each)		3
21		Explanation/Definition (1 Score) Circuit Diagram (1 Score) Input & Output wave (1 Score)		3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
22	a. b.	<p style="text-align: center;">Section - D</p> <p>Proper marking of direction</p> <p>Derivation of <math>E = \frac{\lambda}{2\pi\epsilon_0 r}</math></p> <p style="text-align: center;">or</p> <p>figure (1 score)</p> <p>Equation of Gauss's law (1 score)</p> <p>final equation (1 score)</p>	1 3	4
23	a. b.	<p>Statement / <math>V = IR</math></p> <p>Derivation of <math>\frac{R_1}{R_2} = \frac{R_3}{R_4}</math></p> <p style="text-align: center;">or</p> <p>figure (1 score)</p> <p>final equation (1 score)</p>	1 3	4
24	a. b.	<p>Statement or equation <math>\frac{\sin i}{\sin r} = n</math></p> <p>Explanation of Critical angle (1½ score)</p> <p>Explanation of total Internal reflection (1½ score)</p> <p style="text-align: center;">or</p> <p>figure (1 score)</p> <p>Conditions for TIR (1+1 score)</p>	1 3	4

Qr. No	Sub Qns	Answer Key/Value Points	Score	Total Score
25	a. b.	Definition $\beta = \frac{D\lambda}{d}, \quad d = \frac{D\lambda}{\beta}$ $d = \frac{5 \times 10^{-7} \times 5 \times 10^{-2}}{1 \times 10^{-3}} = 0.025 \text{ mm}$ or Attempt for (a) or (b) or both give full score for part (b) (3 score) For part (a) eligible score only	1  3	4
26	a. b. c.	Section - E Principle / $C = \frac{Q}{V}$ / figure Derivation of $C = \frac{\epsilon_0 A}{d}$ $U = \frac{1}{2} CV^2 \quad (1 \text{ Score})$ $= \frac{1}{2} \times 12 \times 10^{-12} \times 50^2$ $U = 1.5 \times 10^{-8} \text{ J} \quad (1 \text{ Score})$	1 2 2	5
27.	a. b. c.	Right hand thumb rule / grip rule / right hand screw rule Statement or equation Derivation of $B = \frac{\mu_0 I R^2}{2(x^2 + R^2)^{3/2}}$ or	1 1 3	5

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		figure (1/2 Score) Equation of Biot Savart's law (1/2 Score) final equation (1 Score)		
28	a. b. c.	$E = E_0 \sin \omega t / V = V_0 \sin \omega t$ A - Resistor B - Inductor C - Capacitor Phasor diagram (1 Score) $Z = \sqrt{R^2 + (x_L - x_C)^2}$ (1 Score) R - Resistance $x_L$ - Inductive Reactance $x_C$ - Capacitive Reactance } (1 Score)	1 1 3	5
29.	a.	Correct Derivation of $\frac{1}{f} = (n-1) \left( \frac{1}{R_1} - \frac{1}{R_2} \right)$ or figure (1 Score) final equation (1 Score)	3	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
	b.	Diagram of image formation	1	5
	c.	$D \approx 25 \text{ cm}$	1	
1.	Sebastian Mathew		9447521892	
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5.	Sametha. P.S		9744342746	
6.	Abdul Hameed.o.p		9446502921	
7.	PHOYVIB ABOOBACKER.TP		9747050737	
8.	HARIPRASAD.K		9895871825	
9.	LEENA PHILIP		9497615905	
10.	Parvitha Sreedharan		8547135295	
11.	Dr. Augustine Jose. Y.F		9446166537	
12.	JOSE WILFRED		9447451163	
13.	Kavitha. V.G.		9446238236	