


Second Year higher Secondary Examination March 2021 Scoring Indicators

Part III Physics

SY 224

Qn No	Scoring Indicators	Score	Total
1	Magnitude of charges or charges, Square (1/2+1/2)		1
2	(II) Gauss Law in magnetism		1
3	(II) ultraviolet rays		1
4	$\frac{1}{f} = (n - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$		1
5	polarization		1
6	$\lambda = \frac{h}{p}$ or $\lambda = \frac{h}{mv}$		1
7	13.6eV		1
8	$4a_0$ OR $n^2 a_0$ OR four times		1
9	$V = \frac{1}{4\pi\epsilon_0} \frac{Q}{r}$ $V = 4 \times 10^4 \text{ V}$ (unit not necessary) or correct substitution	1 1	2
10	Statement or $dB = \frac{\mu}{4\pi} \frac{I dl \sin \theta}{r^2}$ OR any correct form of equation OR equation only give two	1 1	2
11	 Figure	1	2
	Wheatstone's bridge Balancing condition ($I_g = 0$) Or Wheatstone's equation	1	
12	$\frac{R}{3} = \frac{40}{60} \quad R = 2 \Omega \quad 1 + 1 = 2$ OR Equation or substitution only 1 mark Direct answer without substitution or equation then also give 2 mark		2
13	Any two properties	2	2
14	Definition of half life	1	2
	0.693	1	

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		$T_{1/2} = \text{---}\lambda$		
15		H = nI	1	2
		2000A/m OR Direct answer without substitution or equation then also give 2 mark	1	
16		(a) Substance Q	1	2
		(b) negative	1	
17		$E = L \frac{di}{dt}$	1	2
		L = 4H OR Equation + Substitution (with out answer) give 2 mark. Direct answer without substitution or equation then also give 2 mark	1	
18		Ray diagram	1	2
		Proof	1	

19		$I_m = \frac{V_m}{R}$	1	2
		$I_0 = 0.64A$ OR $I_m = \frac{I_0}{\sqrt{2}}$ Equation for I_{rms} $I_m = \frac{I_0}{\sqrt{2}}$ give 1 mark each Direct answer without substitution or equation then also give 2 mark	1	
20		Any two postulate or equation	2	2
21		OR gate	1	2
		Correct truth table	1	
22		Eddy current	1	2
		Any two applications	1	
23		Definition of electric dipole moment or equation	1	3
		P = 2aq 7.5 x 10 ⁻⁸ Cm – ve Z direction (answer without direction also give 1 mark)	2	
24		Any two properties of electric field lines	2	3

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		 <p>q₁ positive negative</p>	1	
25		Correct derivation of energy stored either mathematically or graphically OR If any correct equation of energy give 1 mark	3	3
26		Any one difference between polar and non polar molecule	1	3
		One example each	2	
27	A	Definition of dip or correct figure showing dip	$\frac{1}{12}$	3
		Tan $\theta = 1$ OR $\theta = 45^\circ$	$\frac{1}{12}$	
28		6 Ω and 3 Ω	1	3
		R = 10 Ω I = 2.4 A OR Equation of series or parallel combination give 1 mark ($\frac{1}{2} + \frac{1}{2} = 1$)	$\frac{1}{1}$	
29				3
		Correct Derivation $B = \mu_0 n I$ give 3 score OR Figure 1 Amperes circuital law 1 Derivation 1		

30		Circuit Diagram showing conversion	1	3
		Explanation OR Equation	2	
31		Derivation of value of instantaneous current give 3 score OR Circuit diagram or phasor 1 Derivation 1 Final answer 1		3
32	a	Displacement current	1	3
	b	$C = \frac{E}{B}$ OR $C = \frac{E}{B_0}$	1	

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		$B = 2.1 \times 10^{-8} T$	1	
33		Explanation with correct figure	3	3
		{Figure - 2 Equation - 1}		
34	a	$KE_{max} = h(\nu - \nu_0)$ any other form of equation	2	3
	b	Explanation of "Negative kinetic energy"	1	
35	a	Figure of parallel combination	1	4
	b	Correct derivation of equivalent capacitance OR Equation only give 1 score	3	
36		<p>Correct derivation of equation of $B = \frac{\mu_0 N I R^2}{2(R^2 + X^2)^{3/2}}$ with figure give 4 score</p> <p>Derivation 2</p> <p>OR</p> <p>Figure 1</p> <p>Biot -Savart Law 1</p>		4
37	a	Energy	1	4
	b	$E = Blv$	1	
		$E = 3.625 \text{ V}$ OR Unit not necessary Ans only or substitution only give 2 score	2	
38		<p>Correct derivation of $\frac{n}{v} - \frac{n_1}{u} = \frac{n_2 - n_1}{R}$ with figure</p> <p>Figure 1</p> <p>Derivation 3</p>	4	4
39		Ray diagram	2	4
		$L = f_0 + f_e$	2	
40		<p>Derivation of Snell's law</p> <p>Figure 2</p> <p>Derivation 2</p> <p>(Equation or statement of Snell's law give 1 score)</p>		4
41	a	Figure (i)	1	4
	b	<p>Correct diagram 2</p> <p>Explanation 1</p> <p>OR If explanation only is correct give 2 score OR correct waveform give 1 score</p>	3	
42	a	True	1	5

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	b	Statement of Gauss Law OR equation	2	
	c	Correct derivation with figure(answer only give 1 score .figure only give 1 score)	2	
43	a	$E \propto l$	2	5
	b	Explain with correct circuit diagram ----- 1 $\frac{E_1}{l_1} = \frac{E_2}{l_2}$ ----- 2 OR If diagram only give 2 score	3	
44	a	(i) mutual induction	1	5
	b	(ii) Any one difference OR Figure of step-up ,step-down	1	
	c	$\frac{V_P}{V_S} = \frac{N_P}{N_S}$	2	
		$N_S = 400$	1	
45		Correct ray diagram	2	5
		Correct derivation $r_1 + r_2 = A$ -----1 $d = i_1 + i_2 - A$ -----1 Answer (snells law) -----1 OR $\frac{A+d}{2}$ or $i - d$ curve OR $r = \frac{A+d}{2}$ etc give 1 score minimum deviation $i = \frac{A}{2}$	3	

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