SECOND YEAR HIGHER SECONDARY EXAMINATION MARCH 2017

SUBJECT : PHYSICS **CODE. NO: 5015**

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
I		(ii) Virtual	1	1
2		Reverse	1	1
3		(ii) $\frac{h}{T}$	1	1
4		Truth table of NOR gate	2	2
5	(a)	(ii) 10^{14}	1	3
	(b)	qr (OR) Charge x dipole length (OR) 2aq (OR) 2qL	1	
	(c)	It will experience torque (OR) It will rotate (OR) Oscillate (OR) undergo SHM (OR) net force = zero (OR) $\vec{\tau} = \vec{p} \times \vec{E}$ / $PE\sin\theta$	1	
6		Modulation index = $\frac{A_m}{A_c} \left/ \frac{V_s}{V_c} \right/ \frac{E_{max} - E_{min}}{E_{max} + E_{min}}$	1	2
		$= \frac{10}{20} = \frac{1}{2} = .5$	1	
		(OR) ($\mu = 0.5$ / $\mu = 50\%$ -2)		
7	(a)	(i) Its material	1	6
	(b)	Effective resistance = 2+2+4 = 8 Ω	1	
		Current $I = \frac{V}{R} = \frac{4}{8} = 0.5$ A	1	
		(OR) $\frac{I}{} = \frac{V}{R}$ -(½)		
		$R_1 + R_2 = R_S$ -(½)		
		$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$ -(½)		

(½)

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		If any student writes answer I = 0.5A give 2 score.		
	c	Connection diagram with one cell or 1000 cells in the secondary circuit	1	
		Principle / $E \propto l$ / Explanation	1	
		$\frac{E_1}{E_2} = \frac{l_1}{l_2}$	1	
8	(a)	(iv) Volt = weber x second	1	
	(b)	$\mathcal{E} = L\frac{dI}{dt}$	1	3
		$= 0.1 \times \frac{3}{1\times10^{-3}} = 300V$	1	
		(OR) $\mathcal{E} = L\frac{dI}{dt}$ only give $1\frac{1}{2}$ score (OR) answer only 300V give 1 score		
9	(a)	(iii) Polarisation	1	
	(b)	Figure	1	
		C Experimental setup / Any figure in Page No. 363 of NCERT Text fig 16.12 (a) or (b)) and	2	5
		Explanation	1	
		$\beta = \frac{\lambda D}{d}$		
		(OR) Derivation { path diff. (1) condition for (1) bright/dark band		

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		$\beta = \frac{\lambda D}{d}$ (1)		
		(OR)		
9	(a)	$\frac{1}{\lambda^4}$ or λ^{-4}	1	
	(b)	Graph - Intensity pattern	2	
		Explanation - any two points of diffraction pattern	2	
		(OR)		
	(b)	figure - experimental set up (1) angle of diffraction, $\theta = \lambda/a$ - (1) Condition for central maxima (1) " Secondary maxima and minima (1)		
10	(a)	Definition or equation $T_{\frac{1}{2}} = 0.693/\tau$	1	4
		$T_{\frac{1}{2}} = \tau \log_e 2$ or $T_{\frac{1}{2}} = 0.693\tau$	1	
		or $\tau = \frac{1}{\lambda}$		
	(b)	Definition of amu	1	
		1 amu = 931 MeV or 931	1	
		(Energy: $\frac{mc^2}{1.6\times10^{-13}}$ - 1 Score / $E = mc^2$ give $\frac{1}{2}$ score)		

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11		Intensity of radiation is no. of photons falling on unit area	1	2
		Current is proportional to no. of photons	1	
		(OR)		
		Intensity - photo current graph with explanation - 2 score		
12	(a)	1.5	1	6
		(OR) $n = \frac{c}{v} - \frac{1}{2}$ score		
	(b)	$n = \sin\left(\frac{A+D}{2}\right) / \sin\left(\frac{A}{2}\right)$	1	
		$\sin\left(\frac{A+D}{2}\right) = n \sin\left(\frac{A}{2}\right)$ / $\sin\frac{60+D}{2} = \frac{\sqrt{2}}{2}$	$\frac{1}{2}$	
		$D = 30°$	$\frac{1}{2}$	
		(OR) $D = 30°$ give 1 score		
	(c)	Ray diagram	1	
		$m = \frac{v}{u}$	$\frac{1}{2}$	
		$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$	$\frac{1}{2}$	
		$m = 1 + \frac{D}{f}$ / $\frac{D}{f}$	1	
13	(a)	(iv) Increases	1	5
	(b)	$q = cv$	1	
		$q\,dv = cv\,dv$	1	
		$\int q\,dv = \int cv\,dv$	1	
		ii Energy = $\frac{1}{2}cv^2$	1	

(4/b)

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		(OR) Q-V graph – (1) Energy given by Area under the graph (1) Area $= \frac{1}{2} bh$ (1) $\therefore$ Energy $= \frac{1}{2} QV = \frac{1}{2} CV^2$ – (1)		
14	(a)	(1) in phase	1	3
	(b)	$V = \sqrt{(V_L - V_C)^2 + V_R^2}$ $= 500V$ OR $V_L - V_C = 300V$ / $V = 500V$ give 1 score	1 1	
		(OR)		
14	(a)	zero	1	
	(b)	$Z = \sqrt{(X_L - X_C)^2 + R^2}$ or $\sqrt{(15-3)^2 + 5^2}$ $Z = 13\Omega$	1 1	
15		Explanation of hysterisis OR (Definition of hysterisis / coerciuity / retentivity / energy loss) Hysterisis curve	1½ 1½	3
16		Any value from the given table	2	2
17	(a)	(1) m^{-1}	1	3
	(b)	Related Explanation	2	

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18		Related Explanation	3	3
19	(a)	(ii) zero	1	
	(b)	Figure of circular coil	1	
		Biot-savart law statement/eqn	1	5
		Derivation	1	
		Final eqn	1	
		(OR)		
19	(a)	Series	1	
	(b)	Figure	1	
		principle	1	
		Explanation/working	1	
		Cyclotron frequency eqn	1	

1. Bosney Freeman
2. Sanil Kumar
3 George. L
4. Geetha. P.R
5. Dr. Augushini Jose. Y.F
6. Sulaiman P
7. Rafeeq K. Nair
8. Mohammed Ali Vazhayi
9. Rajesh. TR
10. Mujeebur Rahiman. M.T
11. Chilla. L
12 Princy, K
13. V. S. Suresh
14 Sen. J.P
15 Faoussy. K.T.P
16. Remy Luke
17 Anitha P. Antony
18 Vijayan Philip
19 Gangadharan. M. 8281106425
20. Hema Kumari. T
21. Aneesh Issac
22. Sudheer Babu K.P.
23. Joy sebastian 9496334774