

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) $\frac{h}{\lambda}$	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) $2aq, (OR) dqL$	1	
	(c)	It will experience torque (OR) It will rotate (OR) oscillate (OR) undergo SHM (OR) net force = zero (OR) $\vec{L} = \vec{p} \times \vec{E} / pE \sin \theta$	1	
6		Modulation index = $\frac{A_m}{A_c} \left[\frac{V_s}{V_c} \left \frac{E_{max} - E_{min}}{E_{max} + E_{min}} \right \right]$ $= \frac{10}{20} = \frac{1}{2} = 0.5$ (OR) $(\mu = 0.5 \quad \quad \mu = 50\% - 2)$	1 1	2
7	(a)	(i) Its material	1	6
	(b)	Effective resistance = $2+2+4 = 8\Omega$	1	
		Current $I = \frac{V}{R} = \frac{4}{8} = 0.5 A$ (OR) $I = \frac{V}{R} - (1/2)$ $R_1 + R_2 = R_s - (1/2)$ $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} - (1/2)$	1	

(1/6)

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		<p>If any student writes answer $I = 0.5A$ give 2 score</p> <p>c Connection diagram with one cell or two cells in the secondary circuit</p> <p>Principle / Ex L / Explanation</p> $\frac{E_1}{E_2} = \frac{l_1}{l_2}$	1 1 1	
8	(a) (b)	<p>(iv) Volt = weber x second</p> $\varepsilon = L \frac{dI}{dt}$ $= 0.1 \times \frac{3}{1 \times 10^{-3}} = 300V$ <p>(OR) $\varepsilon = L \frac{dI}{dt}$ only give $\frac{1}{2}$ score (OR) answer only 300V give 1 score</p>	1 1 1	3
9	(a) (b)	<p>(iii) Polarisation</p> <p>Figure c Experimental setup / Any figure in Page No. 363 of NCERT Text fig 10.12 (a) or (b) and Explanation</p> $\beta = \frac{\lambda D}{d}$ <p>(OR) Derivation { path diff. (1) condition for (1) bright/dark band</p>	1 1 2 1	5



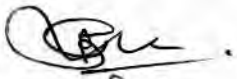
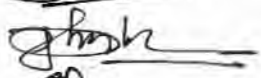

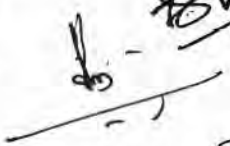


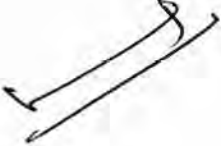
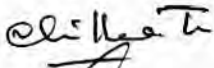
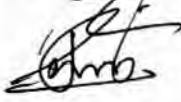
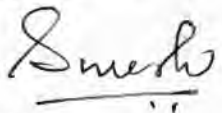





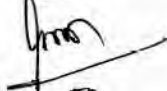



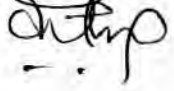
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9	(a)	$\beta = \frac{\lambda D}{d} \quad (1)$ <p style="text-align: center;">(OR)</p> $\frac{1}{\lambda^4} \text{ or } \lambda^{-4}$	1	
	(b)	Graph - Intensity pattern Explanation - any two points of diffraction pattern (OR)	2	
	(b)	figure - experimental setup (i) angle of diffraction, $\theta = \lambda/a$ - (1) Condition for central maxima (1) " Secondary maxima and minima (1)	2	
10	(a)	Definition or equation $T_{1/2} = \frac{0.693}{\lambda}$ $T_{1/2} = \tau \log_e 2 \text{ or } T_{1/2} = 0.693 \tau$ $\text{or } \tau = \frac{1}{\lambda}$	1	
	(b)	Definition of amu $1 \text{ amu} = 931 \text{ MeV or } 931$	1	
	(c)	Energy = $\frac{mc^2}{1.6 \times 10^{13}}$ - 1 Score / $E = mc^2$ give $\frac{1}{2}$ score)	1	
				4

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

(4/6)

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		<p>(OR)</p> <p>Q-V graph - (1)</p> <p>Energy given by Area under the graph (1)</p> <p>Area = $\frac{1}{2}bh$ (1)</p> <p>\therefore Energy = $\frac{1}{2}QV = \frac{1}{2}(V^2)$ (1)</p>		
14	(a)	(1) in phase	1	3
	(b)	$V = \sqrt{(V_L - V_C)^2 + V_R^2}$ $= 500V$ <p>OR $V_L - V_C = 300V / V = 500V$ give 1 score</p>	1	
		(OR)	1	
14	(a)	zero	1	3
	(b)	$Z = \sqrt{(X_L - X_C)^2 + R^2}$ <p>OR $\sqrt{(15-3)^2 + 5^2}$</p> $Z = 13\Omega$	1	
15		<p>Explanation of hysteresis OR (Definition of hysteresis/coercivity, retentivity/energy loss)</p> <p>Hysteresis wave</p>	1 1/2	3
16		Any value from the given table	2	2
17	(a)	$(10)^{-1}$	1	3
	(b)	Related Explanation	2	

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
18		Related explanation	3	3
19	(a)	(i) zero Figure of circular coil Biot-savart law statement/eqn Derivation Final eqn (OR) Series (b) Figure principle Explanation/working Cyclotron frequency eqn	1 1 1 1 1 1 1 1 1	5

1. Bernery Freeman 
2. Sani Kumar
3. George. E 
4. Geetha. P.A 
5. Dr. Augustine Jose. Y.F 
6. Sulaiman P 
7. Rajeev K. Nair 
8. Mathamommed Ali Vashayi 
9. Rajesh TR 
10. Mujeeburalimam. M.T 
11. Chillee. K 
12. Priscy. K 
13. U. S. Suresh 
14. Sen. J.P 
15. Faoussy. K.T.P 
16. Reeny Luke 
17. Anutha. P. Antony 
18. Vijayan Philip 
19. Gangadhasan. M.  8281106425
20. Hena Kumari. T 
21. Aneesh Issac 
22. Sudheer Babu S.P. 
23. Joy Sebastian  9496334774