

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) $\frac{h}{f}$	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) dq	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 = $\frac{A_m}{A_c} \left[\frac{V_s}{V_c} \right] \frac{E_{max} - E_{min}}{E_{max} + E_{min}}$ $= \frac{10}{20} = \frac{1}{2} = 0.5$ (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) $I = \frac{V}{R} - (\frac{1}{2})$ $R_1 + R_2 = R_s - (\frac{1}{2})$ $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} - (\frac{1}{2})$	1	

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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) (iv)	Volt = weber x second	1	3
	(b)	$\epsilon = L \frac{dI}{dt}$ $= 0.1 \times \frac{3}{1 \times 10^{-3}} = 300V$ <p>(OR) $\epsilon = L \frac{dI}{dt}$ only give $1\frac{1}{2}$ score (OR) answer only 300V give 1 score</p>	1 1	
9	(a) (iii)	Polarisation	1	5
	(b)	<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>	2 1	

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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) figure - experimental setup (i) angle of diffraction, $\theta = \lambda/a$ - (i) Condition for central maxima (i) " Secondary maxima and minima (i)	2	
10	(a)	Definition or equation $T_{1/2} = \frac{0.693}{\lambda}$ $T_{1/2} = \tau \log_2 e \text{ or } T_{1/2} = 0.693 \tau$ $\text{or } \tau = \frac{1}{\lambda}$	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

(3/6)

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

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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 = $\frac{1}{2}QV = \frac{1}{2}CV^2$ (1)</p>		
14	(a) (b)	<p>(1) in phase</p> $V = \sqrt{(V_L - V_C)^2 + V_R^2}$ $= 500V$ <p>OR $V_L - V_C = 300V / V = 500V$ give 1 score</p>	1 1 1	3
14	(a) (b)	<p>(OR)</p> <p>zero</p> $Z = \sqrt{(X_L - X_C)^2 + R^2} \text{ or } \sqrt{(15-3)^2 + 5^2}$ $Z = 13\Omega$	1 1 1	
15		<p>Explanation of hysteresis OR (Definition of hysteresis/coercivity/ retentivity/energy loss)</p> <p>Hysteresis curve</p>	1/2 1/2	3
16		Any value from the given table	2	2
17	(a) (b)	<p>(1) m^{-1}</p> <p>Related Explanation</p>	1 2	3

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