SECOND YEAR HIGHER SECONDARY EXAMINATION MARCH 2019

SUBJECT : PHYSICS **CODE. NO: SY 24**

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
1		Helical / Helix / figure	1	1
2		(iii) / NOR gate	1	1
3		$m^2 v^{-1} s^{-1}$ / $cm N^{-1} s^{-1}$ / $As^2 kg^{-1}$ / $cs\, kg^{-1}$	1	1
4		10^{10} h / (iii)	1	1
5	a	1 : 2 / 1/2 / $\frac{\frac{1}{4\pi\varepsilon_0}\frac{p}{r^3}}{\frac{1}{4\pi\varepsilon_0}\frac{2p}{r^3}}$	1	2
		(OR) Any one correct eqn 1/2 Score		
	b	Zero	1	
6	a	$Z = \sqrt{R^2 + (X_L \sim X_C)^2}$ / $Z = \sqrt{R^2 + (\omega L \sim \frac{1}{\omega C})^2}$	1	2
	b	$X_L = X_C$ / $L\omega = \frac{1}{C\omega}$ / Resonance / $Z = R$ / $f = \frac{1}{2\pi\sqrt{LC}}$	1	
		I or P is maximum		
7	i	X- rays	1/2	
	ii	uv - rays	1/2	
	iii	Radio waves / microwaves	1/2	2
	iv	IR rays	1/2	
		(OR)		
		Any two correct answer give 2 Score		
8		Resultant of C_1 & C_2 = 300 μF	1/2	
		" of C_3 & C_4 = 300 μF	1/2	2
		$\frac{1}{C} = \frac{1}{300} + \frac{1}{300}$	1/2	
		$C = 150$ μf	1/2	
		(OR)		
		General equation for series & parallel (1/2 + 1/2)		
		final answer only give 2 Score.		

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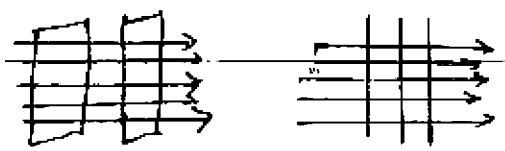
9		~~To detect ice crystals in Saturn's rings~~ In sunglasses, to produce 3D motion pictures, 3 D camera, to view 3D motion pictures, wind screens of trains & aeroplanes, calculators Any two (OR) uses	1x2	2
10	(a)	Semi conductors / Name of any Semiconductors like Ge / Si etc	1	2
	(b)	$\rho = \frac{m}{ne^2\tau}$ / $\rho \propto \frac{1}{L}$	1	
11		Definition of half life period (OR) $T_{\frac{1}{2}} = \frac{0.693}{\lambda}$ / $T_{\frac{1}{2}} = \frac{\log_e 2}{\lambda}$	2	2
12	(a)	Gauss's Law Figure Derivation Final equation (OR) Gauss's Law / eqn Figure / Derivation / Final eqn Fig  eqn. $E = \frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}$ OR $E = \frac{\sigma R^2}{\varepsilon_0 r^2}$	½ ½ ½ ½ 1 1	3
	(b)	$E = 0$	1	
13	(a)	Definition	1	
	(b)	0	1	3
	c	Figure 	1	

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14	(a)	declination	1	
	(b)	$\tan\theta = \frac{B_V}{B_H} = \sqrt{3}$	½	
		$\theta = 60^\circ$	½	3
		$B_H = B\cos\theta$	½	
		$B_H = 2\times10^{-4}\ T \ / \ 2\ G$	½	
		(OR) Any equation like $B = \sqrt{B_H^2 + B_V^2}$, $\tan\theta = \frac{B_V}{B_H}$, $B_H = B\cos\theta$ give 1 score and substitution/answer give 1 score. * Any alternate method give full score		
15	a.	Mutual induction / Electro magnetic induction / Induction	1	
	b	$\frac{V_S}{V_P} = \frac{N_S}{N_P}$	1	3
		N_P = 400 turns / Substitution	1	
16		Figure of experimental set up or figure to prove band width	1	
		Derivation	2	3
		(OR) Description only 1 score & $\beta = \frac{\lambda D}{d}$ only give 1 score		
17	a.	Davisson and Germer expt	1	
		Verification / Explanation	2	
		$\lambda = \sqrt{\frac{150}{V}}\ A^\circ$ / $\lambda = \frac{12.3}{\sqrt{V}}\ A^\circ$ / $\lambda = 2d\sin\theta$ give 1 score		
		(or)		

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
		Any one (OR) part (a) or (b) correct give 2 score		3
18	a	BE = $\Delta m . c^2$ / Δm in u x 931 MeV/ $BE = (Z M_p + (A-Z) M_n - M) c^2$	1	
			1	3
	b	Graph	1	
	c	Fe^{56} / Fe		
		(OR) Any two correct answer give 3 score		
19		Statement of postulate / $L = \frac{nh}{2\pi}$ / $k = mvr = \frac{nh}{2\pi}$	1	
		Any correct derivation for eqn. of radius	1½	4
		Any correct derivation for eqn. of energy	1½	
		(OR) Postulate only give 2 score Equation of radius only 1 score Equation of energy only 1 score		
20	a	Definition or eqn. of mutual inductance	1	
	b	Derivation of $M = \mu_0 n_1 n_2 A L$ / $M = \frac{\mu_0 N_1 N_2 A}{L}$	2	4
	c	$M L^2 T^{-2} A^{-2}$	1	
		(OR) Any two correct answer a/b/c give full score (4)		

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21	a	$m = \frac{f_o}{f_e} = \frac{140}{5} = 28$	2	4
	b	$m = \frac{f_o}{f_e}\left(1+\frac{f_e}{D}\right) = 28\left(1+\frac{5}{25}\right) = 33.6$	2	
		If 'a' or 'b' correct give 4 score (or) any one eqn give 2 score		
22	a	Definition or equation or explanation of modulation index	1	
	b	$\mu = \frac{A_m}{A_c}$	1	4
		$\mu = \frac{10}{20} = 0.5$	1	
	c	X = Amplitude Modulator	1/2	
		Y = Power amplifier / amplifier	1/2	
23	a	Diagram	1	
		Working / Principle	1	
		Derivation / eqn $f = \frac{qB}{2\pi m}$	1	5
	b	$B = \frac{2\pi mf}{q} = 0.66\ T$	1+1	
		Eqn only 1 score, Substitution / Answer – 1		
24	a	Wheatstones bridge principle		
		$\frac{P}{Q} = \frac{R}{S}$ / $\frac{R_1}{R_2} = \frac{R_3}{R_4}$	1	
	b	$\frac{R}{S} = \frac{39.5}{60.5}$	1	
		$R = 8.2\ \Omega$	1	5
		To minimise the resistance of connection	1	
	c	No current / No deflection (or)	1	
		Give 2 score for 'a' and 'b' each		

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25	a	Diagram	1	
		Working	2	
	b	100 Hz	1	5
	c	Output wave form	1	
		(Or)		
		Diagram only give 2 score		
26	a	Concave mirror	1	
	b	figure	1	
		Derivation	1	5
		$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$	1	
	c	Remains the same	1	