PHYSICS MARCH 2019

பகுதி 1 க்கான விடைக்குறிப்புகள்

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	(d) $\frac{r}{(2)^{\frac{1}{3}}}$	$E_a = E_e$ $\frac{2p}{4\pi\varepsilon_o r^3} = \frac{p}{4\pi\varepsilon_o r_1^3} \Rightarrow r_1^3 = \frac{r^3}{2} \Rightarrow r_1 = \frac{r}{(2)^{\frac{1}{3}}}$
2	*(d) 1 : 2*	$T_p = T_\alpha$ $\frac{B_p q_p}{2\pi m_p} = \frac{B_\alpha q_\alpha}{2\pi m_\alpha} \Rightarrow \frac{B_p}{B_\alpha} = \frac{m_p}{m_\alpha} x \frac{q_\alpha}{q_p} = \frac{1}{4} x \frac{2}{1} = \frac{1}{2}$
3	(d) 2 : 1	ELEMENT A: Sample remain after 8 hour = $\frac{1}{16}$; $4T_A = 8$; $T_A = 2$ ELEMENT B: Sample remain after 8 hour $= \frac{1}{256} = \frac{1}{2^8}$; $8T_B = 8$ $\frac{T_A}{T_B} = \frac{2}{1} = 2:1$
4	(c) Xenon flash tube	Threshold wavelengh $\frac{C}{\nu} = \frac{3x10^8}{5x10^{14}} = 6x10^{-7} = 6000\ A$ The wavelength must be less than threshold for photoelec tric effect to takeplace Ruby laser and He Ne laser produces red light of wavelenght 6949A° and 6328 A° which are more than threshold, xenon flash tube produces green light of wavelength 5500A°
5	(b) Capacitor	Capacitative reactance $X_c = \frac{1}{\omega C} = \frac{1}{2\pi\nu C}$ For DC $\nu = 0$ $X_c = \infty$
6	(a) $4r_o$	$r_o = \frac{1}{4\pi\varepsilon_o}\left(\frac{2Ze^2}{E}\right) \alpha \frac{1}{E} \alpha \frac{1}{p^2}$ $\{E = \frac{p^2}{2m}]$ $\frac{r_2}{r_1} = \frac{p^2}{\left(\frac{p}{2}\right)^2} = 4 \Rightarrow r_2 = 4r_1$
₪	(a) $5\frac{1}{2}\beta$	$x_{6B} - x_{1D} = \frac{6\lambda D}{d} - \frac{\lambda D}{2d} = \frac{\lambda D}{d}(6 - \frac{1}{2}) = \frac{11}{2}\beta$
8	(c) A	$A + AB = A(1 + B) = A.1 = 1$

9	$(a)1:1$	Two point charges exerts equal force on each other in opposite direction $\vec{F}_{12} = \vec{F}_{21}$
10	(a) Ionosphereic propagation	
11	(c) $1.05x10^{-34}$ Js	When H2 atom abosobts energy of 10.2 eV (considering hydrogen atom in the ground state) the energy level of electron is - 12.4+10.2 eV = - 3.4 eV Change in angular momentum= $\frac{2h}{2\pi} - \frac{h}{2\pi} = \frac{h}{2\pi} = \frac{h}{2\pi} = \frac{6.627\ x10^{-34}}{2\ x3.14} = .1.05\ x10^{-34}$
12	c) collision	
13	(d) $\frac{1}{300}s$	The current attain first maximum if the augument part of the equation is $\frac{\pi}{2}$. Already the current has an initial phase of $\frac{\pi}{6}$ $100\ \pi t + \frac{\pi}{6} = \frac{\pi}{2} ==> 100\ \pi t = \frac{\pi}{2} - \frac{\pi}{6} = \frac{\pi}{3}$ $t = \frac{1}{300}s$
14	(d) 25 W	$R = \frac{V^2}{R} ==> \frac{V_1^2}{P_1} = \frac{V_2^2}{P_2} ==> P_2 = P_1\left(\frac{V_2}{V_1}\right)^2 = \frac{100}{4} = 25$
15	(b) small couple per unit twist	