

PHYSICS MARCH 2019  
பகுதி 1 க்கான விடைக்குறிப்புகள்

வினா எண்	விடை	விடைக்குறிப்பு மற்றும் விளக்கம்								
	(d) $\frac{r}{(2)^{\frac{1}{3}}}$	$E_a = E_e$ $\frac{2p}{4\pi\epsilon_0 r^3} = \frac{p}{4\pi\epsilon_0 r_1^3} \implies r_1^3 = \frac{r^3}{2} \implies r_1 = \frac{r}{(2)^{\frac{1}{3}}}$								
2	(d) 1 : 2	$T_p = T_\alpha$ $\frac{B_p q_p}{2\pi m_p} = \frac{B_\alpha q_\alpha}{2\pi m_\alpha} \implies \frac{B_p}{B_\alpha} = \frac{m_p}{m_\alpha} \times \frac{q_\alpha}{q_p} = \frac{1}{4} \times \frac{2}{1} = \frac{1}{2}$								
3	(d) 2 : 1	<table border="1"> <thead> <tr> <th>ELEMENT A</th> <th>ELEMENT B</th> </tr> </thead> <tbody> <tr> <td>Sample remain after 8 hour = <math>\frac{1}{16}</math></td> <td>Sample remain after 8 hour = <math>\frac{1}{256} = \frac{1}{2^8}</math></td> </tr> <tr> <td><math>4T_A = 8</math> <math>T_A = 2</math></td> <td><math>8T_B = 8</math></td> </tr> <tr> <td><math>\frac{T_A}{T_B} = \frac{2}{1} = 2 : 1</math></td> <td></td> </tr> </tbody> </table>	ELEMENT A	ELEMENT B	Sample remain after 8 hour = $\frac{1}{16}$	Sample remain after 8 hour = $\frac{1}{256} = \frac{1}{2^8}$	$4T_A = 8$ $T_A = 2$	$8T_B = 8$	$\frac{T_A}{T_B} = \frac{2}{1} = 2 : 1$	
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4	(c) Xenon flash tube	<p>Threshold wavelength</p> $\frac{c}{\nu} = \frac{3 \times 10^8}{5 \times 10^{14}} = 6 \times 10^{-7} = 6000 \text{ \AA}$ <p>The wavelength must be less than threshold for photoelectric effect to take place Ruby laser and He Ne laser produces red light of wavelength 6949\AA and 6328 \AA which are more than threshold, xenon flash tube produces green light of wavelength 5500\AA</p>								
5	(b) Capacitor	<p>Capacitive reactance <math>X_c = \frac{1}{\omega C} = \frac{1}{2\pi\nu C}</math></p> <p>For DC <math>\nu = 0</math> <math>X_c = \infty</math></p>								
6	(a) $4r_o$	$r_o = \frac{1}{4\pi\epsilon_0} \left( \frac{2Ze^2}{E} \right) \propto \frac{1}{E} \propto \frac{1}{p^2} \quad \left\{ E = \frac{p^2}{2m} \right\}$ $\frac{r_2}{r_1} = \frac{p^2}{\left(\frac{p}{2}\right)^2} = 4 \implies r_2 = 4r_1$								
7	(a) $5\frac{1}{2}\beta$	$x_{6B} - x_{1D} = \frac{6\lambda D}{d} - \frac{\lambda D}{2d} = \frac{\lambda D}{d} \left( 6 - \frac{1}{2} \right) = \frac{11}{2}\beta$								
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) Ionospheric propagation	
11	(c) $1.05 \times 10^{-34}$ Js	When H2 atom absorbs 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 = $\frac{2h}{2\pi} - \frac{h}{2\pi} = \frac{h}{2\pi} = \frac{h}{2\pi} = \frac{6.627 \times 10^{-34}}{2 \times 3.14} = .1.05 \times 10^{-34}$
12	c) collision	
13	(d) $\frac{1}{300}$ s	The current attain first maximum if the argument part of the equation is $\frac{\pi}{2}$ . Already the current has an initial phase of $\frac{\pi}{6}$ $100 \pi t + \frac{\pi}{6} = \frac{\pi}{2} \implies 100 \pi t = \frac{\pi}{2} - \frac{\pi}{6} = \frac{\pi}{3}$ $t = \frac{1}{300} \text{ s}$
14	(d) 25 W	$R = \frac{V^2}{P_1} \implies \frac{V_1^2}{P_1} = \frac{V_2^2}{P_2} \implies P_2 = P_1 \left( \frac{V_2}{V_1} \right)^2 = \frac{100}{4} = 25$
15	(b) small couple per unit twist	