1to1 GURU

Learn to Lead, Learn to Succeed

Date :-21/01/2022 **Time :-25 Minutes** **Exam Name :-MHTCET-1to1Guru-3** **Mark :- 30**

1.	**d**	(D) $I_{\text{total}} = \frac{MR^2}{2}$ $I_{\text{removed}} = \frac{M}{4}\frac{(R/2)^2}{2} + \frac{M}{4}\left(\frac{R}{2}\right)^2 = \frac{3MR^2}{32} \left[\because \frac{mr^2}{2} + mh^2\right]$ $I_{\text{remain}} = I_{\text{total}} - I_{\text{removed}}$ $= \frac{MR^2}{2} - \frac{3}{32}MR^2 = \frac{13}{32}MR^2$
2.	**a**	(a) Electron is moving in opposite direction of field so field will produce an accelerating effect on electron.
3.	**b**	(b)
4.	**b**	(B) As at interface, velocity of light reduces by 20% of C Refractive index $= \frac{v_1}{v_2} = \frac{\sin i}{\sin r} = \frac{i}{r}$ $V_2 = 0.8V_1 \therefore \frac{V_1}{V_2} = \frac{1}{0.8} = \frac{5}{4} \therefore \frac{i}{r} = \frac{5}{4} \therefore r = \frac{4}{5}i \therefore \delta = i - r = \frac{i}{5}$
5.	**c**	(C) The force on electron $F = qE$ Acceleration $a = \frac{F}{m} = \frac{q/m}{m}$ $v^2 = 2ax = 2 \times \frac{qE}{m} \times x$ $\therefore \quad v = \sqrt{\frac{2Eqx}{m}}$
6.	**c**	(c) The power loss in AC circuit will be minimum, if resistance is low. In inductance power loss is zero. It applies to high as well as low inductances.
7.	**d**	
8.	**b**	The smaller alkyl group along with oxygen atom is named as alkoxy group and the position of the alkoxy group is indicated by the minimum number.
9.	**d**	$P_4O_{10} + 6H_2O \longrightarrow \underset{\text{Orthophosphoric acid}}{4H_3PO_4}$
10.	**b**	(b) Weaker the base or stronger the acid, stronger is the leaving group $I^{\ominus} > Br^{\ominus} > Cl^{\ominus} > F^{\ominus}$
11.	**d**	(D) Corundum is crystallized alumina while all others are mineral of iron.
12.	**b**	Electrolytes
13.	**a**	(1) Heat of decomposition of water is $H_2O(g) \rightarrow H_2(g) + \frac{1}{2}O_2(g);$ $\Delta H = \frac{+573.2}{2} = 286.6\ \text{kJ/mol}$
14.	**c**	
15.	**d**	
16.	**b**	(b) $\bar{a} - 2\bar{b} + 3\bar{c} = (\bar{i} + \bar{j}) - 2(\bar{j} + \bar{k}) + 3(\bar{i} + \bar{k})$ $= 4\bar{i} - \bar{j} + \bar{k}$

		Required unit vector is $=\dfrac{(4\bar{\imath}-\bar{\jmath}+\bar{k})}{\sqrt{16+1+1}}$ $=\dfrac{1}{3\sqrt{2}}(4\bar{\imath}-\bar{\jmath}+\bar{k})$
17.	**a**	$(x^2+y^2)(h^2+k^2-a^2)=(hx+ky)^2$ $\therefore\ x^2(h^2+k^2-a^2)+y^2(h^2+k^2-a^2)$ $=h^2x^2+k^2y^2+2hkxy$ $\therefore\ x^2(k^2-a^2)+y^2(h^2-a^2)-2hkxy=0$ Here $A=k^2-a^2$, $B=h^2-a^2$, $2H=-2hk$ Since the given pair of lines are perpendicular $\therefore\ A+B=0$ $\therefore\ k^2-a^2+h^2-a^2=0 \Rightarrow h^2+k^2=2a^2$
18.	**a**	
19.	**a**	
20.	**b**	(b) $I=\displaystyle\int_0^{\frac{\pi}{4}}\frac{1-\tan x}{1+\tan x}dx$ $I=\displaystyle\int_0^{\frac{\pi}{4}}\tan\left(\frac{\pi}{4}-x\right)dx$ $I=\left[\log\cos\left(\frac{\pi}{4}-x\right)\right]_0^{\frac{\pi}{4}}$ $I=-\log\dfrac{1}{\sqrt{2}}$ $I=\log\sqrt{2}$
21.	**d**	(D) $\displaystyle\lim_{x\to0}\left(\frac{1+2x}{1-2x}\right)^{1/x}=\lim_{x\to0}\frac{(1+2x)^{\frac{1}{x}}}{(1-2x)^{\frac{1}{x}}}=\lim_{x\to0}\frac{\left[(1+2x)^{\frac{1}{2x}}\right]^2}{\left[(1-2x)^{-\frac{1}{2x}}\right]^{-2}}=\frac{e^2}{e^{-2}}=e^4$
22.	**c**	Here $a=6$, $h=\dfrac{1}{2}$, $b=-40$, $g=\dfrac{-35}{2}$, $f=\dfrac{-83}{2}$, $c=11$ Point of intersection is $\left(\dfrac{hf-bg}{ab-h^2},\dfrac{gh-af}{ab-h^2}\right)$ $\equiv\left(\dfrac{\frac{-83}{4}-700}{-240-\frac{1}{4}},\dfrac{\frac{-35}{4}+249}{-240-\frac{1}{4}}\right)\equiv\left(\dfrac{-2883}{-961},\dfrac{961}{-961}\right)$ $\equiv(3,-1)$