JEE MAIN-2017 CHEMISTRY Code-C Solution

1. (1)

$\Delta T_f = K_f m i$

$0.45 = 5.12 \times m \times i$

$i = 0.527$

$CH_3COOH \rightleftharpoons (CH_3COOH)_2$

1 0

$1-\alpha$ $\alpha/2$

$0.45 = i\,(5.12)\dfrac{0.2/60}{20}\times 1000$

$i = 1-\dfrac{\alpha}{2}$; $0.527 = 1-2-\dfrac{\alpha}{2}$

$\dfrac{\alpha}{2}=0.473$; $\alpha = 0.946$

% association = 94.6%

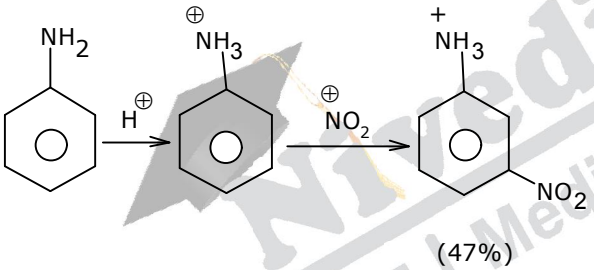
2. (1)

millimoles of $AgNO_3 = \dfrac{1.2\times10^{22}}{6\times10^{23}} \times 1000 = 20$

millimoles of $CoCl_3.6H_2O = 0.1 \times 100 = 10$

Each mole of $CoCl_3.6H_2O$ gives two chloride ions.

3. (4)



4. (4)

$Cl_2 + NaOH \longrightarrow \underset{\text{dil \& cold}}{} NaCl + NaOCl + H_2O$

Cl^- OCl^-

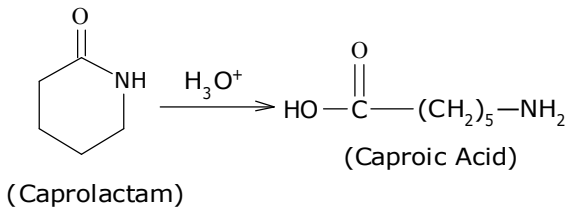
5. (2)

Mg form basic carbonate But Li does not form

6. (4)

Permissible limit of F^- in drinking water is up to 2 ppm. Excess conc. harmful (decay of bones)

7. (2)



8. (3)

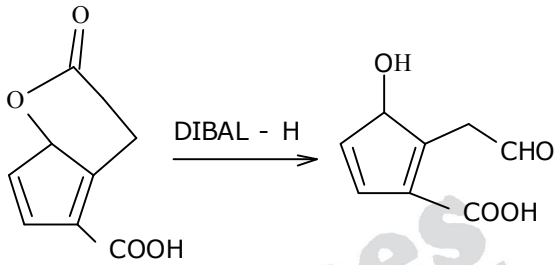
Refractive index of dispersion phase and dispersion medium must differ significantly.

9. (3)

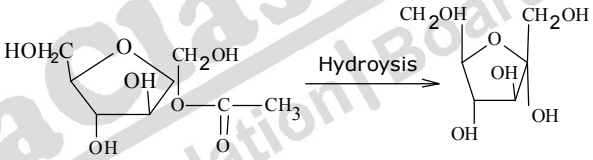
$pH = 7 + \dfrac{1}{2}(pKa - pKb) = 7 + \dfrac{1}{2}(3.2 - 3.4) = 6.9$

10. (2)

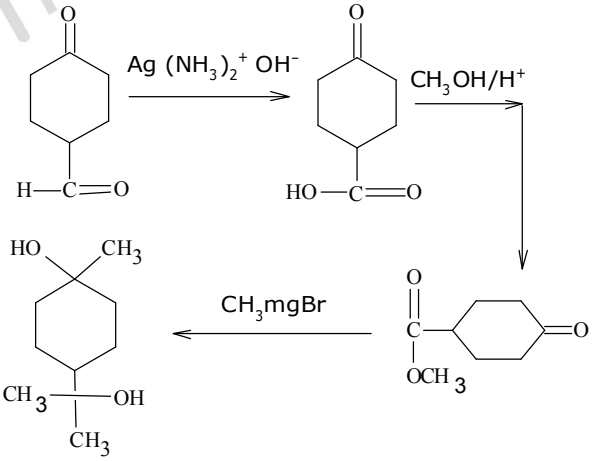
DIBAL – H reduces esters into aldelyde and alcohol



11. (2)



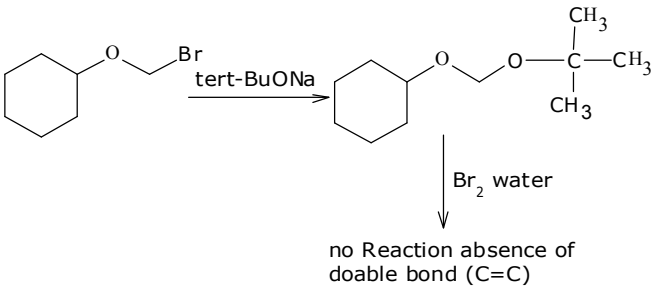
12. (2)



13. (3)

CO has 14 electrons (even) it is diamagnetic

14. (2)



15. (2)

$XeF_4 + O_2F_2 \rightarrow XeF_6 + O_2$
$+4 \quad +1 \quad +6 \quad 0$

16. (4)

Adiabatic process q = 0

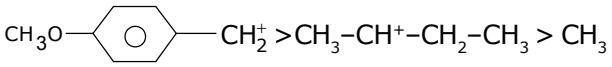
$\Delta U = W$

17. (1)

It is non-benzonide resonance

18. (3)

Rate of $SN_1 \propto$ stability of carbocation



CH_3O — $CH_2^+ > CH_3-CH^+-CH_2-CH_3 > CH_3-CH_2-CH_2^{\oplus}$

19. (3)

$M_2CO_3 + 2HCl \longrightarrow 2MCl + H_2O + CO_2$

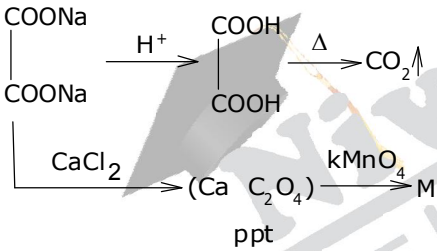
${}^nM_2CO_3 = {}^nCO_2$

$$\frac{1}{M_{M_2CO_3}} = 0.01186$$

$$M_{M_2CO_3} = \frac{1}{0.01186} = 84.3 \text{ g/mol}$$

20. (1)

$X + \text{conc. } H_2SO_4 \rightarrow CO_2$
$X + CaCl_2 \rightarrow$ white ppt

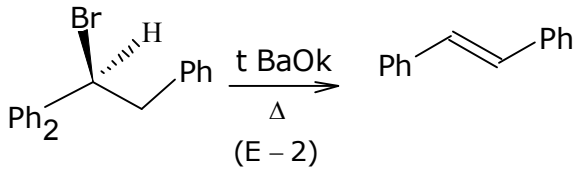


21. (4)

$$\text{mass of Hydrogen} = \frac{10}{100} \times 75 = 7.5 \text{ kg}$$

Replacing ^1H by ^2H would replace 7.5 kg with 15 kg
Net gain = 7.5 kg

22. (3)



(E – 2)

23. (4)

By applying the operation
(i) + 2 × (ii) + iii we get

$\Delta rH^\circ = -393.5 - 285.8 \times 2 + 890.3$
$= -74.8 \text{ kJ mol}^{-1}$

24. (1)

In (a) ZnO acts as acidic oxide because Na_2O is basic oxide (b) ZnO acts as basic oxide because CO_2 is acidic oxide

25. (1)

$$r = r_0 \frac{n^2}{z} \quad n = 2, \quad r_0 = 0.53$$

$$r = 0.53 \times \frac{(2)^2}{1} = 2.12\text{Å}$$

26. (1)

$k_1 = Ae^{-Ea/RT}$

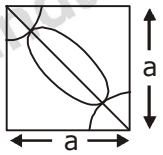
$k_2 = Ae^{-Ea_2/RT}$

$$\frac{k_2}{k_1} \; e^{\frac{1}{RT}(Ea_1 - Ea_2)}$$

$$\ell n \frac{k_2}{k_1} = \frac{Ea_1 - Ea_2}{RT} = \frac{10 \times 10^3}{8.314 \times 300} = 4$$

27. (1)

In FCC



$$r = \frac{1}{\sqrt{2}} a$$

$$\text{closest approach} = 2r = \frac{a}{\sqrt{2}}$$

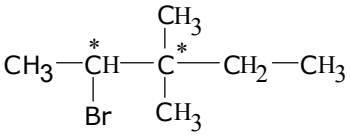
28. (2)

mg^{2+}, Na^+, O^{2-}, and F^- all have 10 electron each

29. (2)

Negative Reduction potential increases reducing tendency increases.

30. (1)

Product → 

total stereoisomers = $2^2 = 4$