JEE MAIN ANSWER KEY & SOLUTIONS

SUBJECT:-CHEMISTRY

CLASS :- 12th

PAPER CODE:-CWT-7

CHAPTER: - ALKYL HALIDE

ANSWER KEY													
1.	(C)	2.	(C)	3.	(C)	4.	(D)	5.	(B)	6.	(A)	7.	(A)
8.	(A)	9.	(A)	10.	(B)	11.	(A)	12.	(B)	13.	(B)	14.	(A)
15.	(C)	16.	(C)	17.	(B)	18.	(A)	19.	(A)	20.	(C)	21.	2
22.	4	23.	29	24.	10	25.	2	26.	5	27.	1	28.	3
29.	5	30.	7										

SOLUTIONS

- **1.** (C)
- Sol. $ROH + SOCl_2 \xrightarrow{Pyridine} R-CI + SO_2 + HCI$
- **2**. (C)
- **Sol.** ROH + SOCl₂ \rightarrow RCl + SO₂ + HCl. It is evident that products other than RCl, are both gases (SO₂, HCl).
- **3.** (C)
- **Sol.** In Hunsdiecker reaction a silver salt of an acid reacts with bromine in the presence of CCl₄.
- **4.** (D)
- **Sol.** Since electrons are in resonance with ring.
- **5**. (B)
- Sol. $CH_3 CH_2 CI \xrightarrow{Alc.KOH} CH_2 = CH_2$ Elimination reaction
- **6**. (A)
- Sol. CH_3 -Br + AgCN \longrightarrow CH_3 -N $\stackrel{?}{=}$ C (A) $\xrightarrow{2H_3O^+}$ CH_3NH_2 (B) + HCOOH
- 7. (A) $CH_3 C CH_3 \xrightarrow{H_2O}$
- Sol. OH $CH_3 \overset{O}{C} CH_3 \xrightarrow{-H_2O} CH_3 \overset{O}{C} CH_3$
- 8. (A) $CH_3-C-CH_3 \xrightarrow{I_2} CHI_3 \xrightarrow{Ag} CH \equiv CH$ O
 Sol. $QH_3-C-CH_3 \xrightarrow{I_2} CHI_3 \xrightarrow{Ag} CH \equiv CH$ $QH_3-CH_3 \xrightarrow{QH_3} CH \equiv CH$ $QH_3-CH_3 \xrightarrow{QH_3} CH \equiv CH$
- **9.** (A) **Sol.** :CCl₂

- **10.** (B)
- Sol. Ph- NH₂ + CHCl3 $\xrightarrow{3KOH} Ph N = C + 3H_2O$
- **11.** (A)
- **Sol.** Due to I effect, Cl atoms tend to attract the electro ns o f C- H bond towards themselves.
- **12.** (B)
- Sol. $\begin{array}{c} CH_3 \\ H \longrightarrow Br \\ CH_3 \end{array}$ $\begin{array}{c} CH_3 \\ Br \longrightarrow H \end{array}$ $\begin{array}{c} CH_3 \\ CH_3 \longrightarrow CH_3 \end{array}$ $\begin{array}{c} CH_3 \\ CH_3 \longrightarrow CH_3 \longrightarrow$
- **13.** (B)
- **Sol.** \xrightarrow{Br} \xrightarrow{Zn} + $ZnBr_2$

Both Br are eliminated from adjacent carbon that is called β elimination.

- **14.** (A)
- **Sol.** Leaving group are different in all substrate So. rate of S_N2 a leaving tendency of leaving group.
- **15.** (C)
- Sol. (A) $CH_3 C = O + PCl_3 Cl \longrightarrow CH_3 C Cl$ H $CH_3 C = O + PCl_3 Cl \longrightarrow CH_3 C Cl$ H $CH_3 C = O + PCl_3 Cl$ H $CH_3 -$
 - (B) $CH_3 C = \underbrace{O + PCl_3}_{CH_3} \underbrace{Cl}_{Cl} \longrightarrow CH_3 \underbrace{Cl}_{CH_3}$
 - (C) $\begin{bmatrix} OH \\ -OH \end{bmatrix}$ + PCI₅ \longrightarrow $\begin{bmatrix} CI \\ -CI \end{bmatrix}$
 - (D) CI CI

16. (C) **Sol**.

Mechanism

$$CH_{3}-CH_{-}CH_{1}-CH_{2}-CH_{-}CH_{3} \xrightarrow{\text{(i) SH}^{\ominus}} CH_{3}-CH_{2}-CH_{2}-CH_{2}-CH_{2}$$

$$CH_{3}-CH_{3}-CH_{3}-CH_{2}-CH_{2}-CH_{2}-CH_{2}$$

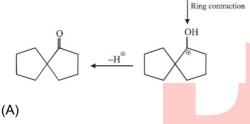
$$CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}$$

$$CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}$$

$$CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}-CH_{3}$$

17. (B) **Sol.**

HO Ring expansion



18. (A) **Sol**.

$$\begin{array}{c} CH_3 \\ CH_4 \\ CH_3 \\ CH_3 \\ CH_4 \\ CH_5 \\ CH$$

in presence of highly branched base hoffmann eliminated product will formed.

19. (A) **Sol.**

20. (C)

Sol. In E_2 elimination reaction. Rate of reaction ∞ (alkyl halide) (base) Alkyl halide and base both have participate in slowest step so rate of reaction is depends on both the conc. of alkyl halide and base. **21.** 2

Sol. The number of step involved in S_N1 and S_N2 mechanisms are given by the set 2, 1 The S_N1 reaction takes place in 2 steps as follows.

$$\begin{array}{c} \text{CH}_{3} \\ \text{CH}_{3} \\ \text{C} - \text{Br} \end{array} \xrightarrow[\text{First step Br}]{\text{CH}_{3}} \xrightarrow{\text{CH}_{3}} \text{C}^{+} \xrightarrow[\text{Second step}]{\text{Fast}} \xrightarrow{\text{CH}_{3}} \text{C} - \text{OH}$$

t-Butyl bromide Carbonium ion

The $S_N 2$ reaction takes place in 1 step as follows -

$$CH_3 - Br \xrightarrow{+OH^-} [HO - - - CH_3 - - - Br]$$

Methyl bromide (one step transition state)

$$\xrightarrow{\text{Fast}} \text{CH}_3\text{OH} + \text{Br}^-$$
Methanol

22. 4

This compound gives four S_N1 product.

23. 29

Sol. Total number of α - hydrogen A + B + C = 29

24. 10

Sol. DDT is a non biodegradable pollutant.

25. 2 **Sol**.

26. 5

Sol.

OCH₃

$$(X)$$
 conc. HI
 $+2$ CH₃ — I

OCH₃
 $-2H_3$
OH
 $-2H_3$
OH
due to large size of (I)

27. 1

Sol.
$$CH_2OH \longrightarrow CH_2B$$

Not break due to double bond character

28. 3

Sol.

$$\begin{array}{c} \text{Br} & \oplus & \ominus \\ \text{I} & \text{(1) NaNH}_2 \\ \text{Ph-CH-CH}_2 & -\text{NH}_3 \\ \text{I} & -\text{NaBr} \end{array} \begin{array}{c} \text{Ph-CH-CH} = \text{CH} \\ \text{(1) NaNH}_2 \\ \text{NANH}_2 \\ \text{-NH}_3 \\ \text{Ph-C} = \text{CH} \end{array}$$

No. of moles of NaNH₂ (π) = 2

Total no. of product \Rightarrow (1 + 2 + 2) \Rightarrow 5

30. 7 **Sol.**

(1)

$$CH_3-CH_2-CH_2-CCH_3-CCH_3-CCH_3$$
 $CH_3-CH_3-CCH_3-CCH_3-CCH_3$
 CH_3-CCH_3

Total no. $S_N 1 + E_1 \longrightarrow f$ of products = 7.