QUIZ

CHAPTER: ALKYL HALIDES

Time: 1 Hr **Marks: 73**

General Instructions:

1. Questions **1–6** are based on **Comprehension**, questions **7–13** have **Only one correct option** and questions **14–16** may have **More than one correct option** and question **17–18 are numerical with single digit integer type answer.** And question **19 is Matrix-Match type answer.**

Marking Scheme:

(a) For questions **1–6**, **+4** marks will be awarded for each **right** answer and **-2** marks will be deducted for each **wrong** answer.

(b) For questions **7–13**, **+3** marks will be awarded for each **right** answer and **-1** mark will be deducted for each **wrong** answer.

(c) For questions **14–16**, **+4** marks will be awarded for each **right** answer and **-2** marks will be deducted for each **wrong** answer.

(d) For questions **17–18**, **+4** marks will be awarded for each **right** answer and **0** marks will be deducted for each **wrong** answer.

(e) For questions **19, +2,** marks will be awarded for each **right** answer and **-1** mark will be deducted for each **wrong** answer.

COMPREHENSION – I (Only one option correct)

Allyl halides and benzyl halides give S_N1 and S_N2 reactions. Allyl halides also give $S_{N_2'}$ mechanism.

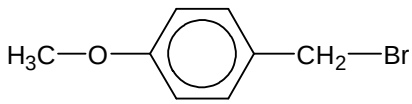
Electron donating group present at ortho or para position in benzyl halides favours S_N1 mechanism whereas electron withdrawing group favours S_N2 mechanism.

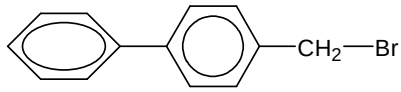
1. Which one of the following compounds give S_N1, S_N2 and $S_{N_2'}$ mechanism?

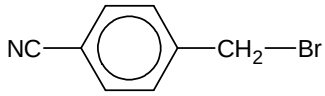
(A) $C_6H_5 – CH_2 – Br$ (B) $CH_3 – CH = CH – CH_2Br$

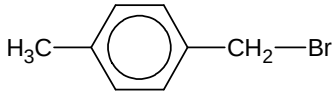
(C) $CH_2 = CH – Cl$ (D) $CH_3 – CH_2 – Br$

2. Which one of the following compounds will give S_N2 mechanism:

(A) 

(B) 

(C) 

(D) 

COMPREHENSION – II (Only one option correct)

In S_N1 reaction of (S) – 2 bromobutane with water, two substitution products are formed, one has the same relative configuration as the reactant and the other has the inverted configuration. This is because in such reactions, the leaving group departs before the nucleophile attack.
In most S_N1 reactions, the racemic product is non – 50 : 50 mixture, i.e. partial racemization takes place, the inverted product is more than 50%. The formation of different composition of the product is due to following steps involved in S_N reactions.

$$R – X \rightarrow R^+X^- \rightarrow R^+ \text{ solvent } X^- \rightarrow R^+ + X^-$$

Undissociated Molecule	Intimate ion pair	solvent – separated ion pair	dissociated ions
I	II	III	IV

3. Which type of intermediate is formed in the reaction of (S)-2-bromobutane with water?

(A) sp^3 hybridized (B) sp^2 hybridized

(C) sp hybridized (D) A transition state

4. 50 : 50 racemic mixture is formed due to the attack of nucleophile on which intermediate species of the reaction?

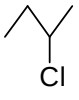
(A) I (B) II

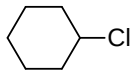
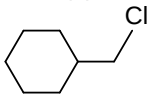
(C) III (D) IV

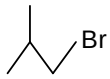
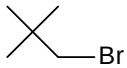
COMPREHENSION – III (Only one option correct)

Rate determining step of S_N1 reaction involves formation of ions, so solvation of these ions are important factor to stabilize them and to decrease the activation energy of their formation. On the other hand less charge separation is generated in transition state of S_N2 reaction. So strong solvation may suppress the nucleophilicity of the nucleophile.

5. Predict the compound in each pair that will undergo the S_N2 reaction faster

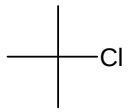
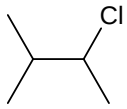
(1)  (I)  (II)

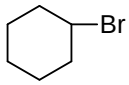
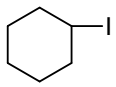
(2)  (III)  (IV)

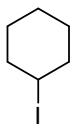
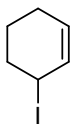
(3)  (V)  (VI)

(A) I, IV, V
(B) I, III, V
(C) II, III, VI
(D) II, IV, V

6. Predict the compound in each pair that will undergo more rapidly by S_N1 in aqueous ethanol

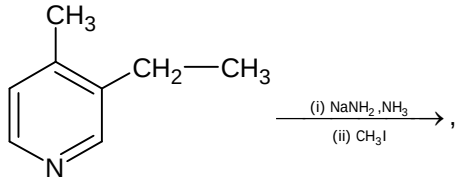
(1)  (I) ,  (II)

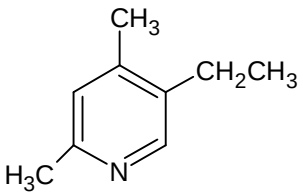
(2)  (III) ,  (IV)

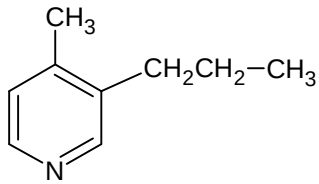
(3)  ,  (V) (VI)

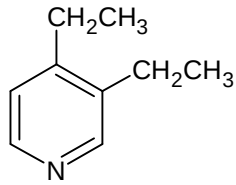
(A) I, III, V
(B) II, IV, VI
(C) II, III, V
(D) I, IV, VI

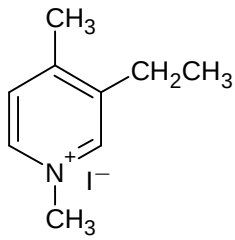
MULTIPLE CHOICE QUESTIONS (Only one correct option)

7. 

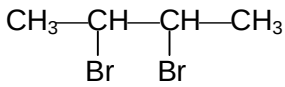
(A) 

(B) 

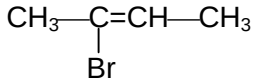
(C) 

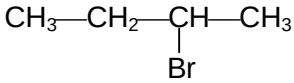
(D) 

8. When 2 butene is treated with N Bromo succinimide the product is

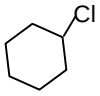
(A) 

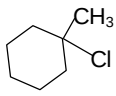
(B) $CH_2BrCH=CHCH_3$

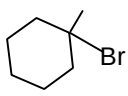
(C) 

(D) 

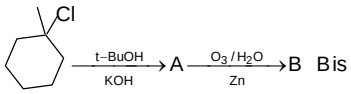
9. The decreasing order of reactivity towards bimolecular substitution for the following compound is

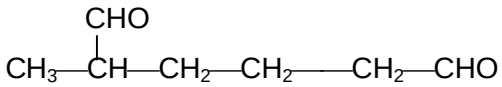

1

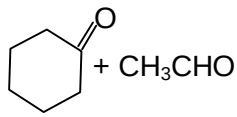

2

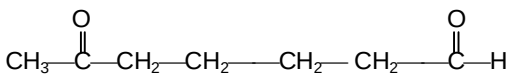

3

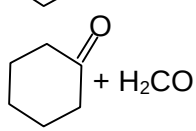
(A) 3, 2, 1
(B) 1, 2, 3
(C) 1, 3, 2
(D) 2, 3, 1

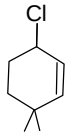
10. 

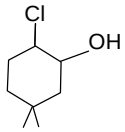
(A) 

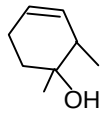
(B) 

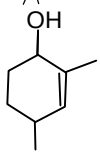
(C) 

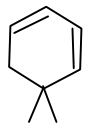
(D) 

11. 
On treatment with aqueous KOH gives

(A) 

(B) 

(C) 

(D) 

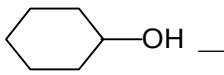
12. $CH_3CHO \xrightarrow{PCl_5} A \xrightarrow{KCN} B \xrightarrow{H_3O^+} C \xrightarrow{\Delta} D$. D is

(A) $CH_3—\underset{\displaystyle Cl}{\underset{|}{CH}}—CO_2—H$

(B) $CH_3—CH_2—CO_2—H$

(C) $CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CO_2—H$

(D) $CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CO_2—H$

13. 

The compound Y in the above sequence is
(A) cyclo hexane
(B) cyclo hexylamine
(C) 2-Bromocyclohexylamine
(D) 4-Bromo cyclohexylamine

MULTIPLE CHOICE QUESTIONS (More than one correct option)

14. Isocyanide test is given by
(A) ethanol
(B) acetone
(C) chloroform
(D) ethyl amine

15. Which will react with ethanolic KCN?
(A) ethyl chloride
(B) acetyl chloride
(C) chlorobenzene
(D) benzaldehyde

16. $C_2H_4Cl_2 \xrightarrow{KCN} (B) \xrightarrow{H_3O^+} (C) \xrightarrow{\Delta} (D)$
(A)

The compound D has the characteristic(s)
(A) It is succinic anhydride if (A) is vic dihalide
(B) It is propionic acid if (A) is gem dihalide
(C) It is succinic anhydride if (A) is gem dihalide
(D) It is propionic acid if (A) is vic dihalide

17.

SINGLE INTEGER ANSWER TYPE

17. The number of chiral compounds of $C_5H_{11}Cl$ are ……..

18. What is the number of monochloro-derivatives obtained by chlorination of 2,2-dimethylpentane.

MATCH-MATRIX TYPE QUESTION

19. Match the **Column-I** with **Column-II:**

	Column – I (Reaction)		**Column – II (Products)**
(A)	Chloroform reacts with HNO_3 acid to form an insecticide.	(p)	Gammaxene
(B)	Silver acetate gets converted into methyl bromide on reaction with Br_2 in CCl_4.	(q)	Dichloro diphenyl trichloro ethane
(C)	Chrobenzene in the presence of conc. H_2SO_4 reacts with trichloro acetaldehyde.	(r)	Chloropicrin
(D)	Benzene reacts with Cl_2 in presence of sun light.	(s)	Compound containing Oxygen
		(t)	Borodiene Hunsdiecker reaction

ANSWERS

1.	**B**	2.	**C**	3.	**B**
4.	**D**	5.	A	6.	**D**
7.	**C**	8.	**B**	9.	**C**
10.	**D**	11.	**B**	12.	**B**
13.	**B**	14.	**C, D**	15.	**A, D**
16.	**A, B**	17.	**3**	18.	**4**
19.	**(A $\rightarrow$ r, s), (B $\rightarrow$ t), (C $\rightarrow$ q), (D $\rightarrow$ p)**				

Solution

5. Less is the steric hindrance, higher is the rate of S_N2 reaction.

6. More stable the carbocation and better leaving group ability favours S_N1 reaction.