SECTION-I (Multiple Choice Questions)
This section contains 30 multiple choice questions. Each question has 4 choices (1), (2), (3) and
(4) for its answer, out which ONLY ONE is correct.

1. Increasing order of equilibrium constants for the formation of a hydrate :

   ![Chemical Structures]

   (1) IV < III < II < I  (2) IV < III < I < II  (3) I < III < II < IV  (4) II < III < I < IV

2. \( \text{C}=\text{C} \text{O} \overset{\text{HgSO}_4; \text{dil H}_2\text{SO}_4}{\longrightarrow} \text{Product (A)} \)

   ![Chemical Structures]

   (1)  (2)  (3)  (4)

3. Above compounds can be differentiated by following reagent :

   (1) 2-4 DNP (Brady reagent)  (2) Tollen’s reagent  (3) Lucas reagent  (4) NaHSO_3

4. \( \text{Product (D) will be :} \)

   ![Chemical Structures]

   (1)  (2)  (3)  (4)
5. \[
\text{C}=\text{=O} \xrightarrow{\text{HNO}_3} \text{C}=\text{=O} \xrightarrow{\text{Ca(OH)}_2} \text{Product (B) in this reaction is:}
\]
(1) (2) (3) (4)

6. \[
\text{C}_16\text{H}_{16} \xrightarrow{\text{O}, \text{Zn,H}_2\text{O}} \text{Ph} \xrightarrow{\text{C}_6\text{H}_5\text{O}, \text{NH}_3} \text{Product (B) in this reaction is:}
\]
(1) (2) (3) (4) both (2) and (3)

7. \[
\text{CH}_3-\text{CH}-\text{CH}-\text{CH}_2-\text{OH} \xrightarrow{\text{HCHO, TsOH, } \Delta} \text{Product (A) is:}
\]
(1) (2) (3) (4)

8. The correct order of rate of reaction toward nucleophilic addition reaction:
(1) \(a > b > c > d > e\)
(2) \(a > b > d > c > e\)
(3) \(a > d > e > b > c\)
(4) \(a > b > e > d > c\)

9. Which of the following \(\beta\) - keto carboxylic acid does not undergo decarboxylation on heating?
(1) \(\text{CH}_2-\text{COOH}\)
(2) \(\text{CH}_2-\text{COOH}\)
10.

\[ \text{HOCH}_2\text{CH}_2\text{CH}_2 \rightleftharpoons \text{C-OCH}_2\text{CH}_3 \xrightarrow{\text{PCC}} (A) \xrightarrow{\text{H}_2\text{C} \rightleftharpoons \text{CHMgBr} \text{ (1 molar equivalent)}} (B) \xrightarrow{\text{NH}_4\text{Cl/H}_2\text{O}} (C) \]

Product (C) is:

(1) 
(2) 
(3) 
(4)

11. \( \text{Ph}-\text{CH}_3 \xrightarrow{\text{Cl}_2\text{O/Cl}_2} (A) \xrightarrow{\text{conc. KOH}} \text{Ph}-\text{CH}_2\text{OH} + (B) \)

Product (B) of the above the reaction is:

(1) \( \text{Ph} - \text{CO}_2\text{H} \)  
(2) \( \text{Ph} - \text{CO}_2^- \)  
(3) \( \text{Ph} - \text{CHO} \)  
(4) \( \text{Ph} - \text{CH}_3 \)

12. \( \text{NH}_2\text{OH} \xrightarrow{} (A) \xrightarrow{\text{H}^+ \Delta} (B) \xrightarrow{\text{LAIH}} (C) \); Product (C) of the reaction is:

(1)  
(2)  
(3)  
(4)
13. The correct order of decreasing value of $K_{eq}$ is :
(1) $a > b > c > d$  
(2) $d > a > b > c$  
(3) $d > b > a > c$  
(4) $d > a > c > d$

14. End product (C) of the reaction is :

15. $(a) \xrightarrow{H^+}(B) ; (A)$ & $(B)$ are isomers ; Isomer (B) is :

16. Which of the following pairs cannot be differentiated by Tollens' reagent ?
(1) Benzaldehyde and benzyl alcohol  
(2) Hexanal and 2-hexanone  
(3) 2-Hexanol and 2-hexanone  
(4) Pentanal and diethyl ether
17. An optically active compound C₆H₁₂O gives positive test with 2,4-dinitrophenyl hydrazine, but negative with Tollens' reagent, what is the structure of the compound?

![Chemical structures]

(1) ![Structure 1](image1.png)  
(2) ![Structure 2](image2.png)  
(3) ![Structure 3](image3.png)  
(4) ![Structure 4](image4.png)

18. Compound (A) C₆H₁₂O₃, when treated with I₂ in aqueous sodium hydroxide gives yellow precipitate. When A is treated with tollens reagent no reaction occur. When A is hydrolysed and then treated with tollens reagent, a silver mirror is formed in test tube. Compound (A) will be:

![Chemical structures]

(1) ![Structure 5](image5.png)  
(2) ![Structure 6](image6.png)  
(3) ![Structure 7](image7.png)  
(4) ![Structure 8](image8.png)

19. End products of the following sequence of reactions are:

![Chemical structures]

(1) yellow ppt. of CH₃,  
(2) yellow ppt. of CH₃,  
(3) yellow ppt. of CH₃,  
(4) yellow ppt. of CH₃,
20. \[
\text{Cl} \quad \text{O} \quad \text{Cl} \quad \overset{\text{alc. KOH}}{\text{(2 mole)}} \rightarrow (A), \text{ product (A) is:}
\]

(1) \[
\text{O} 
\]

(2) \[
\text{O} 
\]

(3) \[
\text{O} 
\]

21. Arrange the following carbonyl compounds in decreasing order of their reactivity in nucleophilic addition reaction.

(1) ii > iii > i > iv
(2) ii > i > iv > iii
(3) iii > ii > i > iv
(4) iii > i > iv > ii

22. \[
(A) \overset{\text{LiAlH}_4}{\longrightarrow} (B) \overset{\text{H}^+}{\longrightarrow} \text{Structure of A is:}
\]

(1) \[
\text{O} 
\]

(2) \[
\text{O} 
\]

(3) \[
\text{O} 
\]

(4) \[
\text{O} 
\]

23. Methyl vinyl ketone on reaction with LiCuMe\textsubscript{2}, H\textsubscript{3}O\textsuperscript{+} gives a major product, whose structure is:

(1) \[
\text{Me} \quad \text{O} \quad \text{Me} 
\]

(2) \[
\text{Me} \quad \text{O} \quad \text{Me} 
\]

(3) \[
\text{Me} \quad \text{O} \quad \text{Me} 
\]

(4) \[
\text{Me} \quad \text{O} \quad \text{Me} 
\]

24. \[
\text{O} \quad \text{CO}_2\text{Et} \quad \overset{\text{H}_2\text{O}^+}{\longrightarrow} A \quad \text{Product obtained is:}
\]

(1) \[
\text{O} \quad \text{CO}_2\text{Et} 
\]

(2) \[
\text{O} 
\]

(3) \[
\text{O} 
\]

(4) None of these
25. Product P is
\[ 6\text{HCHO} + 4\text{NH}_3 \xrightarrow{\Delta} (P) \]
(1) Urotropine  (2) Aldimine  (3) acetophenone  (4) Benzophenone

26. Product (P) is
\[ \text{Ph} \quad \text{OH} \quad \text{Ph} \quad \xrightarrow{\Delta} \quad \text{Ph} \quad \text{OH} \quad \text{Ph} \]
(1) Ph - OH  (2) Ph - Ph  (3) Ph - CHO  (4) Ph - CHO

27. Arrange their stabilities of given gem-diols in decreasing order.
(I)  (II)  (III)  (IV)

(1) I > II > III  (2) III > II > I  (3) I > III > II  (4) III > I > II

28. \[ \text{HCHO} + \text{CHO} \xrightarrow{\text{conc. NaOH}} (X) + (Y) \]
X & Y is
(1) HCOO⁻, OH⁻  (2) COO⁻, CH₃OH  (3) Ph - CH₂OH, HCOO⁻  (4) COO⁻, CH₃OH

29. Two isomeric ketones, 3-pentanone and 2-pentanone can be distinguished by:
(1) I₂/NaOH only  (2) NaSO₂H only  (3) NaCN/HCl  (4) Both (1) and (2)

30. Acetaldehyde cannot give:
(1) Iodoform test  (2) Lucas test  (3) Benedict test  (4) Tollen’s test
# IIT-JEE 2019
## CRASH COURSE (MAIN)
### TOPIC: ALDEHYDES & KETONES
#### DATE: 15/11/18

## ANSWER KEY

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