

QUIZ

CHAPTER: ALDEHYDES AND KETONES

Time: 1 Hr

Marks: 73

General Instructions:

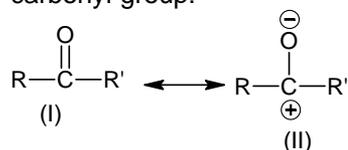
1. Questions 1–6 are based on **Comprehension**, questions 7–13 have **Only one correct option** and questions 14–16 may have **More than one correct option** and question 17–18 are **numerical with single digit integer type answer**. And question 19 is **Matrix-Match type answer**.

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)

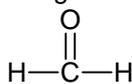
Stability of carbonyl compounds can be understood by considering the resonating structures of the carbonyl group:



Although structure (II) is not a major contributor but stability of aldehydes and ketones can be known only by this resonating structure. The reactivity of carbonyl compounds depends on the stability of this compound.

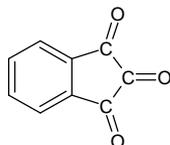
1. Which of the given compounds give addition reaction with water?

(A)



(B) CCl_3-CHO

(C)



(D) All of the above

2. Which one of the following compounds is most reactive for nucleophilic addition reactions?

(A) Cyclopropanone

(B) Cyclobutanone

(C) Cyclopentanone

(D) Cyclohexanone

COMPREHENSION - II (Only one option correct)

In the presence of a strong base aldehydes without α -hydrogen undergo self-oxidation reduction, i.e., disproportionation reaction. This is known as Cannizzaro reaction. In the first step rapid addition of OH^- to one molecule of Aldehyde results in the formation of a hydroxyl alkoxide ion which acts as a hydride ion donor to the second molecule of aldehyde in the final step of the reaction. The acid and the alkoxide ion exchange proton for reasons of stability.

3.
$$\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H} \xrightarrow[\text{H}^+]{\text{NaOH}}$$
 Product Q will be

(A) Glycolic acid

(B) Glyceraldehyde

(C) Sodium salt of glycolic acid

(D) glycol

4.
$$2\text{HCHO} \xrightarrow[\text{H}^+]{\text{NaOH}}$$
 What are the correct option about the reaction?

(A) Two products will be formed

(B) Formic acid is a product

(C) Methyl alcohol is a product

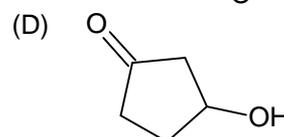
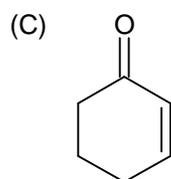
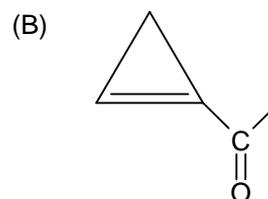
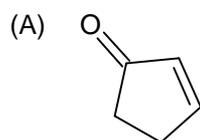
(D) All are correct

COMPREHENSION - III (Only option correct)

Citral or 3,7-Dimethyl-2,6-Octadienal or Lemonal is a mixture of a pair of terpenoids having molecular formula $C_{10}H_{16}O$. The 2 compounds are double bond isomers. The E-isomer is known as Geranial (Citral - A). The Z isomer is known as Neral (Citral - B). Whereas Geranial has a strong lemon odour Neral enjoys a mild lemony fragrance. Citral therefore finds application in making deodorants and soaps.

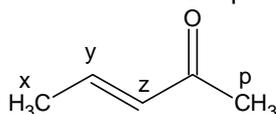
Citral, when subjected to reductive ozonolysis forms 3 compounds - X, Y and Z (decreasing molar mass, $X > Y = Z$).

5. Identify the 'false' statement:
 (A) Citral - A and B are diastereomers
 (B) All fragments obtained on reductive ozonolysis of reduced citral (Wolff Kishner Reduction) undergo haloform reaction
 (C) Y and Z cannot be distinguished by Fehling's reagent
 (D) Citral is an isoprene - based natural polymer (dimer)
6. X when reacted with 5% hot and dilute baryta water will form what major product:



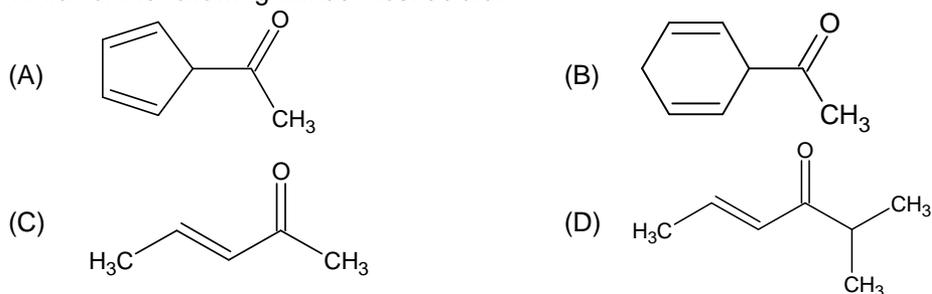
MULTIPLE CHOICE QUESTIONS (Only one correct option)

7. The abstraction of proton will be fastest, in which carbon in the following compound,

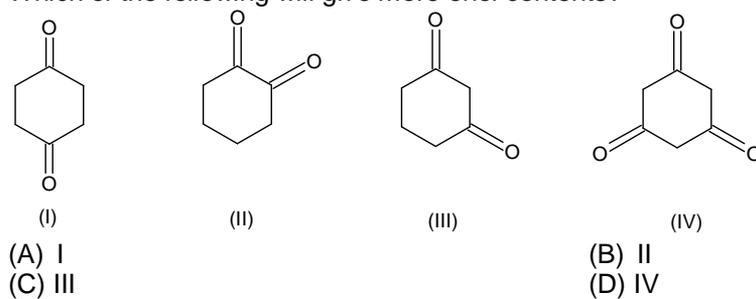


- (A) x
 (B) y
 (C) z
 (D) p

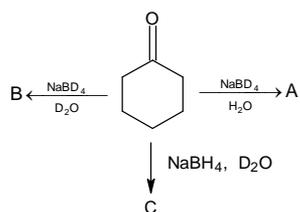
8. Which of the following will be most acidic?



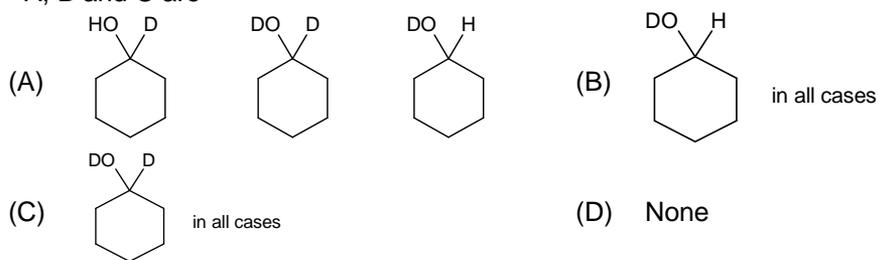
9. Which of the following will give more enol contents?



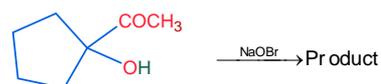
10.



A, B and C are



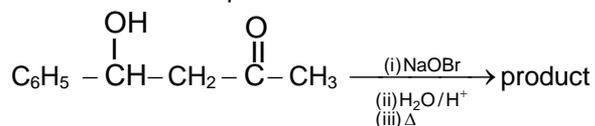
11.



The product is



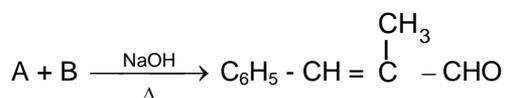
12. In the reaction sequence



product will be

- (A) $\text{C}_6\text{H}_5 - \overset{\text{OH}}{\underset{|}{\text{CH}}} - \text{CH}_2 - \text{COOH}$
 (B) $\text{C}_6\text{H}_5 - \text{COOH}$, $\text{COOH} - \text{COOH}$ and CHBr_3
 (C) $\text{C}_6\text{H}_5 - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH}_3$, CO_2 and CHBr_3
 (D) Only CHBr_3

13. In the reaction sequence



- (A) and (B) will be
 (A) $\text{C}_6\text{H}_5 - \text{CHO}$ and CH_3CHO (B) $\text{C}_6\text{H}_5 - \text{CH}_2 - \text{CHO}$ and CH_3CHO
 (C) $\text{C}_6\text{H}_5 - \text{CHO}$ and $\text{CH}_3\text{CH}_2\text{CHO}$ (D) $\text{C}_6\text{H}_5\text{COCH}_3$ and CH_3CHO

MULTIPLE CHOICE QUESTIONS (More than one correct option)

14. Which reacts with Fehling's solution?

- (A) acetaldehyde (B) acetone
 (C) formaldehyde (D) formic acid

15. $3\text{HCHO} + \text{CH}_3\text{CHO} \xrightarrow{\text{NaOH}}$ A. A can

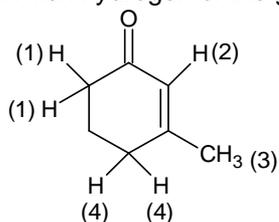
- (A) reduce Tollen's reagent (B) give Cannizzaro reaction
 (C) react with Na (D) give green colour with $\text{Cr}_2\text{O}_7^{2-}/\text{H}^+$

16. The base-catalyzed aldol condensation will not occur with

- (A) Propionaldehyde (B) Benzaldehyde
 (C) 2-Methyl propionaldehyde (D) Acetone

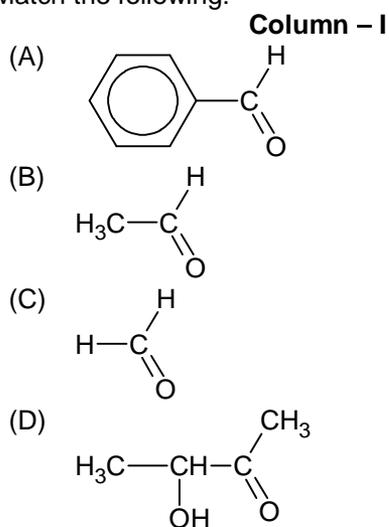
SINGLE INTEGER ANSWER TYPE

17. The total number of nitrogen atom(s) in urotropin is.....
18. Which hydrogen of the given compound is least acidic in nature?



MATRIX MATCH TYPE QUESTION

19. Match the following:



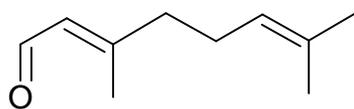
- Column – II**
- (p) Positive iodoform test
- (q) Reduces Fehling's solution
- (r) Positive Tollen's test
- (s) Brady's reagent turns red
- (t) Positive Lucas reagent test

ANSWERS

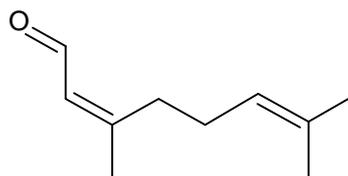
- | | | |
|---|-------------|----------------|
| 1. D | 2. A | 3. A |
| 4. D | 5. C | 6. A |
| 7. A | 8. A | 9. D |
| 10. A | 11. B | 12. C |
| 13. C | 14. A, C, D | 15. A, B, C, D |
| 16. B, C | 17. 4 | 18. 2 |
| 19. A → (r, s) B → (p, q, r, s) C → (q, r, s) D → (p, q, r, s, t) | | |

Solution

5.



Citral - A



Citral - B

6. Intramolecular Aldol condensation of X.

