ALDEHYDES, KETONES & CARBOXYLIC ACID

CHAPTER-12

TEST-A

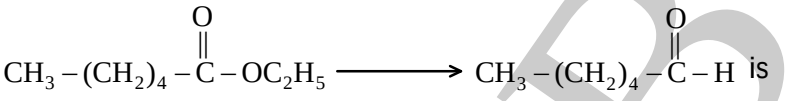
SOLVED

Time:1 hr. **Max. Marks: 30**

SECTION-A

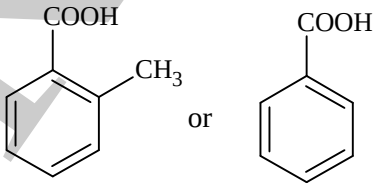
Tick the correct option:

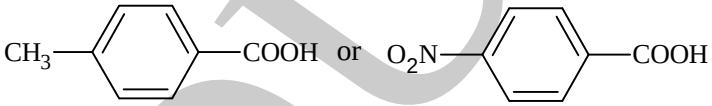
1. The reagent used in the selective reduction of **[1]**

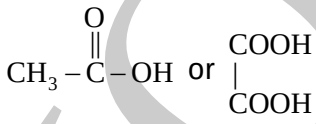


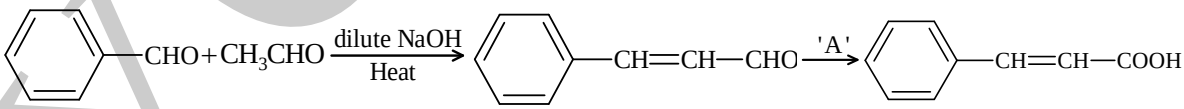
(i) $LiAlH_4$ (ii) $NaBH_4$ (iii) DIBAL-H (iv) H_2/Ni

2. In each of the following acid pairs, the first acid has a lower pKa value than the second except in **[1]**

(i) CH_3CO_2H or CH_2FCO_2H (ii) 

(iii) 

(iv) 

3. 

[1]

(i) PCC (ii) $KMnO_4/H^+$ (iii) H_2CrO_4 (iv) Ag_2O

Assertion-Reason type Questions:

(i) If assertion and reason both are correct and reason is the correct explanation of assertion.

(ii) If assertion and reason both are correct and reason is not the correct explanation of assertion.

(iii) If assertion is correct and reason is wrong.

(iv) If assertion is wrong and reason is correct.

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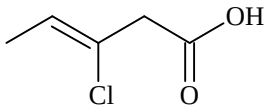
4. Assertion: Ethanal undergoes aldol condensation to form 3-hydroxy butanal. **[1]**
   Reason: Aldehydes containing alpha hydrogen can undergo aldol condensation.

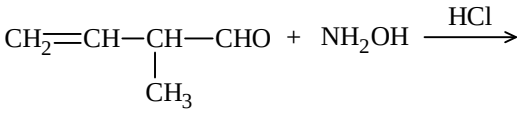
5. Assertion: Benzaldehyde is less reactive than methanal towards HCN. **[1]**
   Reason: The positive charge on aldehyde carbon in benzaldehyde is completely delocalised with benzene ring.

One word /One Sentence type Questions.

6. Write IUPAC name of the following compound: **[1]**



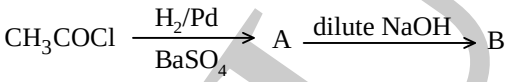
7. Complete the following: **[1]**

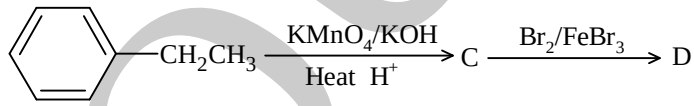


SECTION-B

8. Give reason: **[2]**
   (i) $NH_2CONHNH_2$ has two NH_2 groups but only one undergo condensation with carbonyl group of aldehyde or ketones.
   (ii) Carboxylic acids have a higher boiling point than alcohol of comparable molecular mass.

9. Write the structure of A to D: **[2]**

(i) 

(ii) 

10. Explain the following name reaction: **[2]**
    (i) Wolff-Kishner reaction
    (ii) Hell-Volhard-Zelinsky reaction

11. Arrange the following in order of increasing property indicated **[3]**
    (i) HCHO, CH_3COCH_3, CH_3CH_2CHO, C_6H_5CHO (towards HCN)
    (ii) $ClCH_2COOH$, FCH_2COOH, CH_3COOH, C_6H_5COOH (acidic strength)
    (iii) CH_3CHO, CH_3COCH_3, CH_3COOH, CH_3OCH_3 (boiling point)

12. How will you bring about the following conversion? **[3]**
    (i) Ethanol to 2-hydroxy propanoic acid
    (ii) propanoic acid to propanal
    (iii) Benzene to benzoic acid

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13. (a) Which of the following reagents are used to distinguish the following pair of organic compounds: **[1½ + ½ + 1]**

    (i) Methanal and methanoic acid

    (ii) Acetophenone and benzophenone

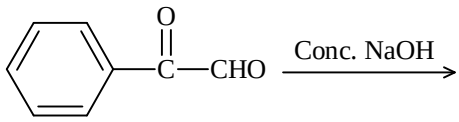
    (iii) Propanone and propanal

    Reagents are: $NaHCO_3$, I_2 / NaOH, $[Ag(NH_3)_2]OH$

    (b) Write the structure of the following compound:

    2-Hydroxy-5-oxopentanoic acid

    (c) Complete the following:



14. (a) Convert: **[2+1]**

    (i) Methanal into n-butane

    (ii) Ethyl benzene into benzyl alcohol

    (b) Why is benzoic acid a stronger acid than phenol?

15. (a) Organic compound A(C_3H_8O) gives a brisk effervescence with sodium metal. On reaction with pyridine chlorochromate, A form B (C_3H_6O). Vigorous oxidation of B gives acetic acid. B gives a yellow precipitate with 2, 4-DNP and forms a compound C with semicarbazide. Identify compounds A, B and C. Write the reactions involved. **[3+2]**

    (b) (i) Draw the structure of the carbonyl group.

    (ii) Predict the hybridisation of the carbon atom.

    (iii) Label the nucleophilic and the electrophilic centre.

    (iv) What is the geometry of the carbonyl group?

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