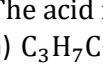
Date : **TEST ID: XIICH1202**
Marks : **CHEMISTRY**

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Single Correct Answer Type

31. Claisen condensation is not given by
    a) 
    b) 
    c) 
    d) 
32. Which of the following is a flavouring agent called 'oil of winter green'?
    a) Olive oil b) Vinegar c) Methyl acetate d) Methyl salicylate
33. The following reaction is known by the name of:
    $$\underset{\text{Xylene}}{CH_3COCl} + H_2 \xrightarrow[Pb/BaSO_4]{[H]} CH_3CHO + HCl$$
    a) Stephen's reduction
    b) Rosenmund's reaction
    c) Cannizzaro's reaction
    d) None of these
34. The enol form of acetone, after treatment with D_2O gives
    a)  b) c)  d) 
35. $CH_3COOH \xrightarrow{NH_3} \xrightarrow{\Delta} ?$
    The product of the reaction is isomeric with
    a)  b) $CH_3CH = NHO$ c) $HCONH - CH_3$ d) All of these
36. The acid formed when propyl magnesium bromide is treated with CO_2 is:
    a) C_3H_7COOH b) C_2H_5COOH c) Both (a) and (b) d) None of these
37. Tamarind contains
    a) (+) tartaric acid b) (−) tartaric acid c) ± tartaric acid d) None of the above
38. The splitting of an ester by an alcohol is known as:
    a) Acidolysis b) Alcoholysis c) Ammonolysis d) Hydrolysis
39. The product formed when hydroxylamine condenses with a carbonyl compound is called
    a) Hydrazide b) Oxime c) Hydrazine d) Hydrazone
40. ΦCHO undergoes Claisen condensation with another aldehyde to give cinnamaldehyde. The aldehyde is
    a) Formaldehyde b) Acetaldehyde
    c) Crotonaldehyde d) Propanaldehyde
41. Two mole of acetic acid are heated with P_2O_5. The product formed is:
    a) 2 mole of ethyl alcohol
    b) Formic anhydride
    c) Acetic anhydride
    d) 2 mole of methyl cyanide
42. The nitrogen content in the proteins can be quantitatively estimated by:
    a) Carius method
    b) Kjeldahl's method
    c) Victor Meyer's method
    d) Rast method
43. Correct order of reducing power of the following carbonyl compounds
    a) $HCHO > CH_3COCH_3 > \phi CHO$ b) $CH_3COCH_3 > \phi CHO > HCHO$
    c) $HCHO > \phi CHO > CH_3COCH_3$ d) $CH_3COCH_3 > HCHO > \phi CHO$

44. Cyanohydrin of which of the following forms lactic acid?
a) HCHO b) CH_3COCH_3 c) CH_3CHO d) CH_3CH_2CHO

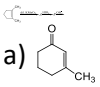
45. Ethyl acetate on reaction with a Grignard reagent gives,
a) Alcohol b) Aldehyde c) Acid d) Ketone

46. Acetaldehyde reacts with HCN followed by hydrolysis forms a compound which shows:
a) Optical isomerism
b) Geometrical isomerism
c) Metamerism
d) Tautomerism

47. Carboxylic acids dissolve in *aq*. NaOH because the acids undergo:
a) Protonation b) Deprotonation c) Carboxylation d) Decarboxylation

48. Which of the acids cannot be prepared by Grignard reagent?
a) Acetic acid b) Succinic acid c) Formic acid d) All of these

49. Compound *A* when treated with ethyl magnesim iodide in dry ether forms an addition compound which on hydrolysis form compound *B*. The compound *B* on oxidation form 3-pentanone. Hence, the compound *A* and *B* are
a) Propanol, 3-pentanol b) Pentanol, 3-pentanol c) Ethanal, pentanal d) Acetone, 3-pentanol

50. Suggest appropriate structures for the missing final compound. (The number of carbon atom remains the same throughout the reaction.)
a)  b)  c)  d) 

51. Lactic acid on heating with conc. H_2SO_4 gives
a) Acetic acid b) Formic acid c) Acrylic acid d) Propionic acid

52. Urea can be detected by
a) Benedict test b) Molisch test c) Ninhydrine test d) Biurate test

53. Which of the following does not give brick red precipitate with Fehling's solution?
a) Acetaldehyde b) Formalin c) D-glucose d) Acetone

54. Which of the following statements is wrong?
a) Formic acid is stronger than acetic acid
b) *o*-bromobenzoic acid is weaker than *o*-chlorobenzoic acid
c) Lactic acid does not answer the silver mirror test
d) Benzaldehyde does not reduce Fehling's solution

55. Pick out the reaction in which formic and acetic acid differs from each other:
a) Sodium replaces hydrogen from the compound
b) Forms esters with alcohols
c) Reduces solution of ammoniacal silver nitrate or Fehling's solution of dil. acid $KMnO_4$
d) Turns red litmus blue

56. An organic substance from its aqueous solution can be separated by:
a) Solvent extraction b) Steam distillation c) Distillation d) Fractional distillation

57. The strongest acid amongst the following compounds is
a) CH_3COOH b) $HCOOH$ c) $CH_3CH_2CH(Cl)CO_2H$ d) $ClCH_2CH_2CH_2COOH$

58. What is obtained what acetyl chloride is heated with benzene in presence of anhydrous $AlCl_3$
a) Acetyl benzoic acid b) Anisol c) Acetonephenone d) Chlolorobenzene

59. Reaction of formaldehyde and ammonia gives
a) Hexamethylene tetramine b) Bakelite
c) Urea d) Triethylene tetramine

60. 4-methyl benzene sulphonic acid reacts with sodium acetate to give
a)  b)  c)  d) 

Date :
Marks :

TEST ID: XIICH1202
CHEMISTRY

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

ANSWER KEY

31)	a	32)	d	33)	b	34)	a
35)	d	36)	a	37)	a	38)	b
39)	b	40)	b	41)	c	42)	b
43)	c	44)	c	45)	d	46)	a
47)	b	48)	c	49)	a	50)	a
51)	c	52)	d	53)	d	54)	c
55)	c	56)	a	57)	c	58)	c
59)	a	60)	a				

Date : **TEST ID: XIICH1202**
Marks : **CHEMISTRY**

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

HINTS AND SOLUTIONS

31 **(a)**
In Claisen condensation aromatic aldehydes having no α −hydrogen atom react with aldehyde, ketones or esters having α −hydrogen atom in presence of dilute alkali to form α, β −unsaturated carbonyl compound. $e.g.$,

As it does not containα −hydrogen atom.

32 **(d)**
Methyl salicylate an ester has smell of oil of winter green and used as medicine in iodex; the pain reliever of strains in muscles.

33 **(b)**
Rosenmund's reaction involves reduction of acid chlorides to aldehydes by the action of H_2 in presence of $Pd/BaSO_4$. $BaSO_4$ acts as poison for Pd and prevents further reduction of aldehydes to alcohol.

34 **(a)**
After treatment with D_2O, the H^+ ion of $-OH$ group is replaced by D^+ ion, because of being more reactive than deuterium

$$CH_3 - \underset{\underset{OH}{|}}{C} = CH_2 \xrightarrow{D_2O} CH_3 - \underset{\underset{OD}{|}}{C} = CH_2$$

35 **(d)**

$$CH_3COOH \xrightarrow{NH_3} CH_3COONH_4 \xrightarrow[-H_2O]{\Delta} CH_3CONH_2$$

acetic acid ammonium acetate acetamide
The isomers of CH_3CONH_2 is
1. NH_2CH_2CHO
2. $CH_3 - CH = NOH$
3. $H - CONH - CH_3$

38 **(b)**

$$CH_3COOCH_3 + C_2H_5OH \longrightarrow CH_3COOC_2H_5 + CH_3OH$$

40 **(b)**
Cinnamaldehyde is prepared by the Claisen reaction between benzaldehyde and acetaldehyde

$$C_6H_5CHO + CH_3CHO \xrightarrow{NaOH} \underset{\text{cinnamaldehyde}}{C_6H_5OH = CHCHO} + H_2O$$

41 **(c)**

$$2CH_3COOH \xrightarrow{P_2O_5} (CH_3CO)_2O + H_2O$$

P_2O_5 acts as dehydrating agent.

44 **(c)**

Carbonyl compound + HCN →cyanohydrin$\xrightarrow{H_2O/H^+}$hydroxy acid

Latic acid is

∴ Cyanohydrin of acetaldehyde forms lactic acid.

46 **(a)**

Carbon is asymmetric.

48 **(c)**

Carboxylic acids are prepared by reaction of Grignard reagent with CO_2.

∵ Formic acid (HCOOH)has only one carbon atom

∴ Formic acid cannot be prepared from Grignard reagent.

$$\underset{\text{Grignard reagent}}{R\text{Mg}X} + \text{CO}_2 \rightarrow R-\underset{\|}{\overset{\text{O}}{\text{C}}}-\text{OMg}X \xrightarrow{\text{HOH}} \underset{\text{acid}}{R\text{COOH}}$$

51 **(c)**

Lactic acid on heatng with conc. H_2SO_4 to give acrylic acid

52 **(d)**

When urea is heated it gives the biurate which give violet colour with $CuSO_4$ and NaOH.

56 **(a)**

An immiscible solvent is added to the solution. Some of the solute passes in this solvent maintaining Nernst distribution law $K = \frac{C_1}{C_2}$, where C_1 and C_2 are concentration of solute in two phases.

57 **(c)**

Electron withdrawing group (-Ieffect) stabilizes the anion, and thus increases acidic nature.

Thus (c), (d)> (a), (b) acidic

Farther the electron withdrawing group from the –COOH group, its effect in increasing acid strength decreases thus (c) with Cl at α −position is stronger than (d) with Cl at γ −position.

58 **(c)**

When, benzene is heated with acetyl chloride, in presence of anhydrous $AlCl_3$, electrophilic substitution takes place and acetophenone is obtained. The reaction is known as Friedel-Craft acylation.

59 **(a)**

: $6\text{HCHO} + 4\text{NH}_3 \rightarrow \underset{\text{hexamethylene tetramine}}{(\text{CH}_2)_6\text{N}_4} + 6\text{H}_2\text{O}$

60 **(a)**

4-methyl benzene sulphonic acid is stronger than acetic acid thus, it will release acetic acid from sodium acetate.