NEET ANSWER KEY & SOLUTIONS

SUBJECT :- CHEMISTRY

CLASS :- 12th **PAPER CODE :- CWT-9**

CHAPTER :- ALDEHYDE & KETONE ,CARBOXYLIC ACID

ANSWER KEY

1.	(C)	**2.**	(C)	**3.**	(B)	**4.**	(C)	**5.**	(B)	**6.**	(A)	**7.**	(C)
8.	(C)	**9.**	(C)	**10.**	(C)	**11.**	(A)	**12.**	(D)	**13.**	(A)	**14.**	(B)
15.	(C)	**16.**	(D)	**17.**	(A)	**18.**	(A)	**19.**	(A)	**20.**	(C)	**21.**	(D)
22.	(D)	**23.**	(A)	**24.**	(D)	**25.**	(B)	**26.**	(C)	**27.**	(B)	**28.**	(C)
29.	(C)	**30.**	(C)	**31.**	(C)	**32.**	(A)	**33.**	(A)	**34.**	(A)	**35.**	(A)
36.	(A)	**37.**	(A)	**38.**	(C)	**39.**	(A)	**40.**	(C)	**41.**	(D)	**42.**	(D)
43.	(D)	**44.**	(C)	**45.**	(A)	**46.**	(B)	**47.**	(C)	**48.**	(B)	**49.**	(C)
50.	(C)												

SOLUTIONS

SECTION-A

1. (C)

Sol. Aldehydes and ketones have elevated boiling points due to dipole-dipole attraction.

2. (C)

Sol. Aldehydes are easily oxidized to carboxylic acid but ketones are difficult to oxidise. Most books say that the hydrogen directly bonded to the C=O. in the aldehyde is what aids the oxidation process

3. (B)

Sol. Carbonyl compounds are best purified by hydrolysis of sodium bisulphite adducts.

4. (C)

Sol. $CH_3-CH=CH-CH_3 \xrightarrow[(ii)H_2/Zn]{(i)O_3} 2CH_3-CHO$

$CH_3-C\equiv CH \xrightarrow{Hg^{2+}H^{\oplus}}$

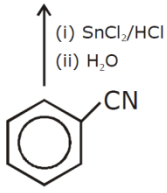
$CH_3-\overset{OH}{\overset{|}{C}}=CH_2 \leftrightarrow CH_3-\overset{O}{\overset{||}{C}}=CH_3$

5. (B)

Sol. $CH_3MgI + CH_3CN \xrightarrow{H^{\oplus}} CH_3-CO-CH_3$

6. (A)

Sol. $C_6H_6COCl \xrightarrow{Pd\text{-}BaSO_4} C_6H_6CHO$



7. (C)

Sol. Aldehydes are more reactive than ketones and +I effect of alkyl groups and steric factor decreases rate.

8. (C)

Sol. Protonation is the fastest step.

9. (C)

Sol. This is due to increase in electron releasing or +I effect.

10. (C)

Sol. CH_3–OH + HCOONa are formed.

11. (A)

Sol. It is known that basic need for the existance of Keto-enol tautomers is the presence of at least one hydrogen atom at adjacent sp^3 carbon of carbonyl carbon.

12. (D)

Sol. $CH_3C\equiv CH \xrightarrow{H^{\oplus}/Hg^{2+}} CH_3-\overset{O}{\overset{||}{C}}-CH_3$

13. (A)

Sol. $C_7H_{14} + O_3 \longrightarrow C_3H_6O + CH_3-CH_3-\overset{O}{\overset{||}{C}}-CH_3$

14. (B)

Sol. $(CH_3)_2C=O \xrightarrow[HCl]{NaCN} (CH_3)_2C(OH)CN \xrightarrow{H^{\oplus}}$ $(CH_3)_2C(OH)CO_2H$.

15. (C)

Sol. Due to high polarity of C–O bond in $H-\overset{O}{\overset{||}{C}}-H$

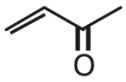
16. (D)

Sol. $HC\equiv CH \xrightarrow[Hg^{2+}]{H_2SO_4}$ $HCOCH_3$ $\xrightarrow{NaOH}$ $CH_3CH(OH)CH_2CHO$.

17. (A)

Sol. This is etard reaction

18. (A)

Sol. $HCHO + CH_3COCH_3 \rightarrow$ 

19. (A)

Sol. $C_6H_5CHO + KOH \rightarrow C_6H_5CH_2-OH + C_6H_5COOK$

Cannizzaro reaction

20. (C)

Sol. (1) $R-COR^1 \xrightarrow[HCl]{Zn/Hg} RCH_2R$

(b) Clemmensen reduction

(2) $>C=N-NH_2 \xrightarrow[C_2H_5ONa]{\Delta} >CH_2 + N_2$

(d) Wolf Kishner reducution

(3) $R-C=O + \text{Aluminium isopropoxide} \rightleftharpoons R-CH-OH$ (Heat)

21. (D)

Sol. (1) C_6H_5CHO (d) Cannizzaro reaction
(2) CH_3COCHO (c) Iodoform reaction
(3) CH_3COCH_3 (a) Mesitylene
(4) CH_3CHO (b) Paraldehyde

22. (D)

Sol. All of these are intermediates during aldol condensation.

23. (A)

Sol. I $CH_3-\underset{\underset{OH}{|}}{CH}-CH-CHO$ (CH_3 on CH)

II $CH_3-CH_2-\underset{\underset{OH}{|}}{CH}-CH_2-CHO$

24. (D)

Sol. $2CHCOCH_3 \xrightarrow{Ba(OH)_2} CH_3C(OH)(CH_3)CH_2\,COCH_3$

aldol condensation

25. (B)

Sol.

C_6H_6

$\downarrow$ $AlCl_3$, CH_3Cl — Friedal craft reaction

$C_6H_5CH_3$

$\downarrow$ CrO_2Cl_2 — Etrad reaction

C_6H_5CHO

$\downarrow$ $CH_3CHO/NaOH$ — Aldol reaction

$C_6H_5CH = CHCOOH$

26. (C)

Sol. This is because the grignard reagent causes changes only in the carbon oxygen bond which is same for both aldehydes and ketones.

27. (B)

Sol. Benzaldehyde does not give Fehling's test as it does not have alpha hydrogen.

28. (C)

Sol. They can be differentiated by iodoform test as CH_3–C=O group is present only in ethanal

29. (C)

Sol. The other part is $KNaC_4H_4O_6$ i.e. 'felhings b'

$OH-CH-COONa$ (OH on CH)

$OH-CH-COOK$ (OH on CH)

Rochelle salt

30. (C)

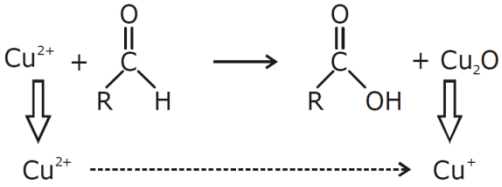
Sol. (i) Positire iodoform test indicates presence of $CH_3-\underset{\underset{O}{||}}{C}-$ group which narrows it to acetaldehyde (a) and acetone (c).

(ii) Not reducing felhing's and tollen's shows it is not an aldehyde but a ketone. So it is acetone(c).

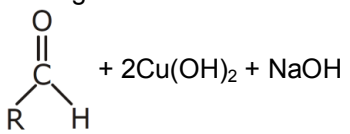
(iii) Acetone gives cyanohydrin with HCN. (This is a confirmation)

31. (C)

Sol. Benedicts test



Fehling test



$RCOONa + Cu_2O + 3H_2O$

$Cu^{2+} \dashrightarrow Cu^{+}$

32. (A)

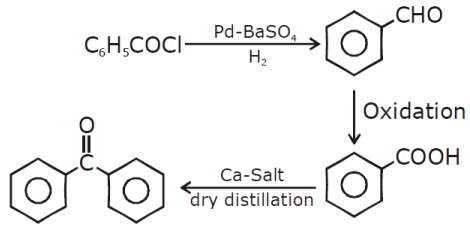
Sol. Only aldehydes having alpha or acidic hydrogen can reduce fehling's and tollen's.

33. (A)

Sol. For more reactivity in nucleophilic addition, the carbonyl carbon should be more electron deficient. Presence of "R" group / +I groups decrease the electron deficiency. More these groups present, less is the reactivity. Though Ar group are –I groups they reduce reactivity due to steric hindrance.

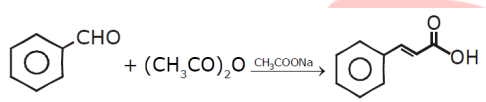
34. (A)

Sol.



35. (A)

Sol.

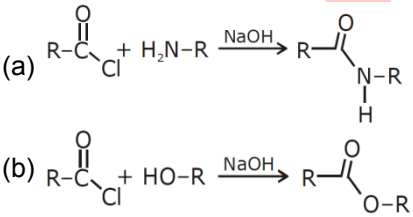


SECTION-B

36. (A)

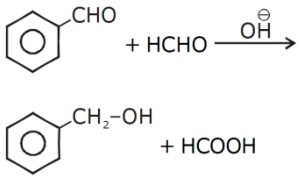
Sol. $C_6H_5CHO + Cl_2 \rightarrow C_6H_5COCl + HCl$

Schotten-Baumann reaction



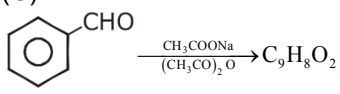
37. (A)

Sol.



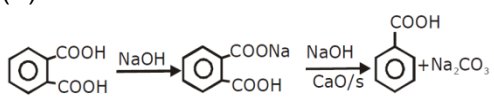
38. (C)

Sol.



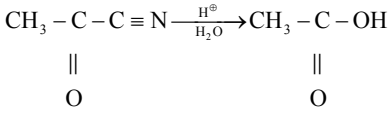
39. (A)

Sol.



40. (C)

Sol.



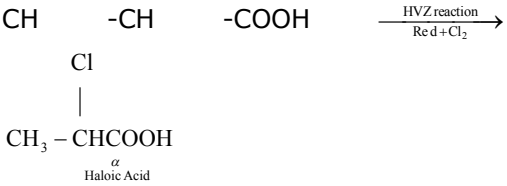
41. (D)

Sol. $CH_3\text{-}COOH + NaHCO_3 \longrightarrow CH_3COONa + CO_2 + H_2O$

Fehling solution test, tollen reagent are used to test presence of aldehydic group.

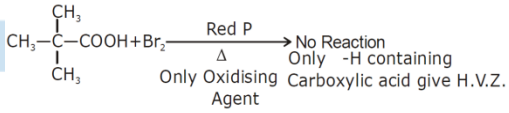
42. (D)

Sol.



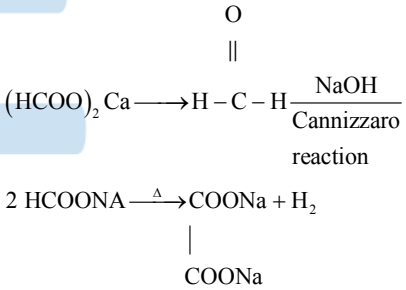
43. (D)

Sol.



44. (C)

Sol.

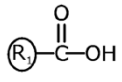


45. (A)

Sol. β -Keto acid decarboxylate easily.

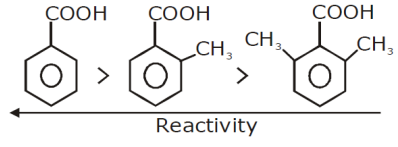
46. (B)

Sol. Rate of reactivity of acid, when attached with more electron withdrawing group



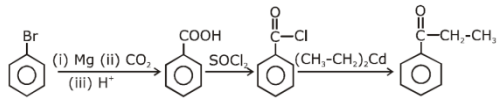
(R_1 is more electron withdrawing)

$(R_2 - CH_2OH)$ while its reactivity decreases if R_1 is electron donating group.



47. (C)

Sol.



48. (B)

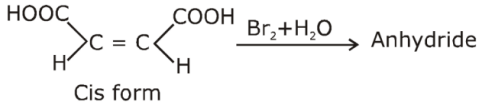
Sol. Rate of reactivity carboxylic acid ↓ as groups attached to α –C are electron donating. $-CH_3$ is electron donating via +I effect. Order of reactivity of esterification of given carboxylic acid with ethanol is

HCOOH > CH_3–COOH >

$$CH_3-\underset{H}{\underset{|}{C}}(CH_3)-COOH > CH_3-\underset{CH_3}{\underset{|}{C}}(CH_3)-COOH$$

49. (C)

Sol.



Cis form

50. (C)

Sol.