PRACTICE PAPER

23

CHEMISTRY

Time allowed: 45 minutes **Maximum Marks: 200**

General Instructions: *Same as Practice Paper–1.*

Choose the correct option.

1. **Physical adsorption**
   (*a*) involves the weak attraction between the adsorbent and adsorbate.
   (*b*) involves the chemical interaction between the adsorbent and adsorbate.
   (*c*) is irreversible in nature.
   (*d*) increases with increase in temperature.

2. **The plot of rate of reaction (*y*-axis) versus concentration of reactant (*x*-axis) gives a line parallel to *x*-axis. The order of reaction is**
   (*a*) First order (*b*) Second order (*c*) Zero order (*d*) None of these

3. **Electrolytes conduct electricity due to movement of**
   (*a*) atoms (*b*) ions (*c*) electrons (*d*) molecules

4. **A solution of amalgam of mercury with sodium contains**

Solute	Solvent	Solute	Solvent
(*a*) Solid	Solid	(*b*) Solid	Liquid
(*c*) Liquid	Solid	(*d*) Liquid	Liquid

5. **Which of the following is true about the value of refractive index of quartz glass?**
   (*a*) Same in all directions (*b*) Different in different directions
   (*c*) Cannot be measured (*d*) Always zero

6. **In which pair most efficient packing is present?**
   (*a*) *hcp* and *bcc* (*b*) *hcp* and *ccp*
   (*c*) *bcc* and *ccp* (*d*) *bcc* and simple cubic cell

7. **50 mL of an aqueous solution of glucose $C_6H_{12}O_6$ (Molar mass : 180 g/mol) contains 6.02×10^{22} molecules. The concentration of the solution will be**
   (*a*) 0.1 M (*b*) 0.2 M (*c*) 1.0 M (*d*) 2.0 M

8. **The solution that can be stored in copper container is**
   (*a*) $ZnSO_4$ (*b*) $AgNO_3$ (*c*) $AuCl_3$ (*d*) all of these

9. **A chemical reaction was carried out at 300 K and 280 K. The rate constants were found to be k_1 and k_2 respectively. Then**
   (*a*) $k_2 = 0.5k_1$ (*b*) $k_2 = 0.25k_1$ (*c*) $k_2 = 2k_1$ (*d*) $k_2 = 4k_1$

10. **The catalyst used for the oxidation of ammonia to nitric oxide is**
    (*a*) cupric chloride (*b*) iron oxide (*c*) platinum (*d*) manganese dioxide

11. An unripe mango placed in a concentrated salt solution to prepare pickle, shrivels because _____.

(*a*) it gains water due to osmosis. (*b*) it loses water due to reverse osmosis.

(*c*) it gains water due to reverse osmosis. (*d*) it loses water due to osmosis.

12. If *a* stands for the edge length of the cubic systems: simple cubic, body centred cubic and face centred cubic, then the ratio of the radius of the spheres in these systems will be respectively

(*a*) $\frac{1}{2}a:\frac{\sqrt{3}}{4}a:\frac{1}{2\sqrt{2}}a$ (*b*) $\frac{1}{2}a:\sqrt{3}a:\frac{1}{\sqrt{2}}a$ (*c*) $\frac{1}{2}a:\frac{\sqrt{3}}{2}a:\frac{\sqrt{2}}{2}a$ (*d*) $1a:3a:\sqrt{2a}$

13. For a redox reaction to be spontaneous, the emf of the cell must be

(*a*) zero (*b*) –ve (*c*) +ve (*d*) all of these

14. The half life period of a first order reaction is

(*a*) half of the rate constant.

(*b*) independent of initial concentration of reactants.

(*c*) directly proportional to the initial concentration of reactants.

(*d*) same for all reactions.

15. Which of the following involves oxidation-reduction?

(*a*) $NaBr + HCl \longrightarrow NaCl + HBr$

(*b*) $HBr + AgNO_3 \longrightarrow AgBr + HNO_3$

(*c*) $H_2 + Br_2 \longrightarrow 2HBr$

(*d*) $Na_2O + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O$

16. The potential of a hydrogen electrode in an aqueous solution is 0.591 V at 25°C. The pH of the solution is

(*a*) 10 (*b*) 1 (*c*) 5.9 (*d*) 4

17. The order of reactivity of following alcohols with halogen acids is _____.

(A) $CH_3—CH_2—CH_2—OH$ **(B)** $CH_3CH_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}—OH$ **(C)** $CH_3CH_2—\overset{\displaystyle CH_3}{\overset{|}{\underset{\displaystyle CH_3}{\underset{|}{C}}}}—OH$

(*a*) (A) > (B) > (C) (*b*) (C) > (B) > (A)

(*c*) (B) > (A) > (C) (*d*) (A) > (C) > (B)

18. Alum is an example of

(*a*) normal salt (*b*) double salt (*c*) complex salt (*d*) none of these

19. The total number of possible isomers for the complex compound $[Cu^{II}(NH_3)_4]$ $[Pt^{II}Cl_4]$ are

(*a*) 3 (*b*) 6 (*c*) 5 (*d*) 4

20. In froth floatation process for the purification of ores, the ore particles float because

(*a*) they are light.

(*b*) their surface is not easily wetted by water.

(*c*) they bear electrostatic charge.

(*d*) they are insoluble.

21. The salt which is least likely to be found in minerals is

(*a*) chloride (*b*) sulphate (*c*) sulphide (*d*) nitrate

22. The number of electrons that are involved in the oxidation of $KMnO_4$ in basic medium is

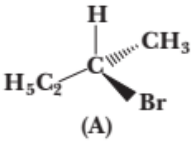
(*a*) 1 (*b*) 3 (*c*) 2 (*d*) 5

23. In the dichromate ion, $Cr_2O_7^{2-}$

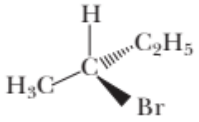
(*a*) all Cr—O bonds are equivalent. (*b*) 6 Cr—O bonds are equivalent.

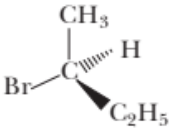
(*c*) 3 Cr—O bonds are equivalent. (*d*) no bonds are equivalent.

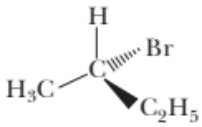
24. Which of the following structures is enantiomeric with the molecule (A) given below:

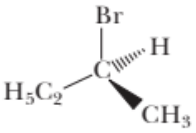


(A)

(a) 

(b) 

(c) 

(d) 

25. Chlorobenzene is formed by reaction of chlorine with benzene in the presence of $AlCl_3$. Which of the following species attacks the benzene ring in this reaction?

(a) Cl^- (b) Cl^+

(c) $AlCl_3$ (d) $[AlCl_4]^-$

26. In the preparation of compounds of Xe, Bartlett had taken $O_2^+ Pt F_6^-$ as a base compound. This is because:

(a) both O_2 and Xe have same size.

(b) both O_2 and Xe have same electron gain enthalpy.

(c) both O_2 and Xe have almost same ionisation enthalpy.

(d) both Xe and O_2 are gases.

27. The correct order of increasing bond angles in the following species is:

(a) $Cl_2O < ClO_2^- < ClO_2$ (b) $ClO_2^- < Cl_2O < ClO_2$

(c) $Cl_2O < ClO_2 < ClO_2^-$ (d) $Cl_2O < ClO_2 < ClO_2^-$

28. The first ionisation energy of the elements of the first transition series

(a) increases as the atomic number increases.

(b) decreases as the atomic number increases.

(c) do not show any change as the addition of electron takes place in the inner $(n-1)$ *d*-orbitals.

(d) none of the above

29. A coordination complex compound of cobalt has the molecular formula containing five ammonia molecules, one nitro group and two chlorine atoms for one cobalt atom. One mole of this compound produces three mole ions in solution. On reacting the solution with excess of $AgNO_3$ solution, we get two moles of AgCl precipitates. The formula of this complex would be

(a) $[Co(NH_3)_4(NO_2)\ Cl]NH_3Cl$ (b) $[Co(NH_3)_5Cl]\ [Cl(NO_2)]$

(c) $[Co(NH_3)_5(NO_2)]Cl_2$ (d) $[Co(NH_3)_5(NO_2)_2\ Cl_2]$

30. Given below are two statements labelled as Assertion and Reason:

Assertion (A) : Both rhombic and monoclinic sulphur exist as S_8 but oxygen exists as O_2.

Reason (R) : Oxygen forms $p\pi - p\pi$ multiple bond due to small size and small bond length but $p\pi - p\pi$ bonding is not possible in sulphur.

(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

(c) Assertion is correct statement but reason is wrong statement.

(d) Assertion is wrong statement but reason is correct statement.

31. Given below are two statements labelled as Assertion and Reason:

Assertion (A) : F_2 has lower bond dissociation enthalpy than Cl_2.

Reason (R) : Fluorine is more electronegative than chlorine.

(*a*) Assertion and reason both are correct statements and reason is correct explanation for assertion.

(*b*) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

(*c*) Assertion is correct statement but reason is wrong statement.

(*d*) Assertion is wrong statement but reason is correct statement.

32. Iodoform reaction is not given by

(*a*) butanal
(*b*) butan–2–one
(*c*) ethanol
(*d*) isopropyl alcohol

33. Which of the reagents forms a crystalline derivative with glucose?

(*a*) Fehling solution
(*b*) Phenyl hydrazine
(*c*) Hydroxyl amine
(*d*) Benedict solution

34. Which of the following compounds will give brisk effervescence of CO_2 on treatment with $NaHCO_3$?

(*a*) Phenol
(*b*) Acetic acid
(*c*) Both (*a*) and (*b*)
(*d*) None of these

35. Which one of the following is employed as antihistamine?

(*a*) Omeprazole
(*b*) Chloramphenicol
(*c*) Diphenhydramine
(*d*) Norethindrone

36. Polymerization in which two or more chemically different monomers take part is called

(*a*) addition polymerization
(*b*) copolymerization
(*c*) chain polymerization
(*d*) homo polymerization

37. Given below are two statements labelled as Statement P and Statement Q:

Statement P : Methanol is stronger acid than water.

Statement Q : All alcohols are stronger acid than water.

(*a*) P is true, but Q is false
(*b*) P is false, but Q is true
(*c*) Both P and Q are true
(*d*) Both P and Q are false

38. Acetanilide on nitration followed by alkaline hydrolysis mainly gives

(*a*) *o*-nitroaniline
(*b*) *p*-nitroaniline
(*c*) *m*-nitroaniline
(*d*) 2. 4, 6-trinitroaniline

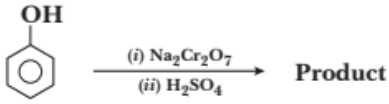
39. Tertiary alcohols on reaction with $KMnO_4$ at elevated temperature forms

(*a*) aldehyde
(*b*) ketone
(*c*) mixture of carboxylic acids containing lesser number of carbon atoms
(*d*) mixture of carboxylic acids containing more number of carbon atoms

40. Acetic acid exists as dimer in benzene due to

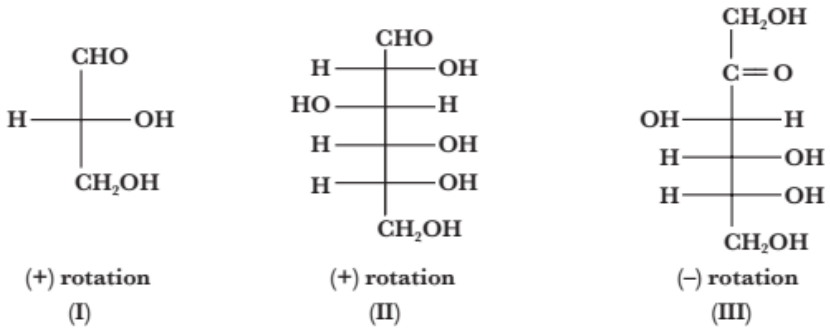
(*a*) condensation reaction
(*b*) presence of carbonyl group
(*c*) presence of hydrogen atom at α-carbon
(*d*) hydrogen bonding

41. The product of the following reaction is



(*a*) Benzene
(*b*) Benzoquinone
(*c*) Picric acid
(*d*) Salicylaldehyde

42. Optical rotations of some compounds along with their structures are given below which of them have D configuration?



(*a*) I, II, III (*b*) II, III (*c*) I, II (*d*) III

43. 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

44. Match the reactions given in Column I with the information given in Column II.

Column I		Column II	
A.	Kolbe's reaction	(*i*)	Reaction of alkyl halide with sodium alkoxide
B.	Williamson's synthesis	(*ii*)	Ethyl alcohol
C.	Reimer-Tiemann reaction	(*iii*)	Conversion of phenol to *o*-hydroxysalicylic acid
D.	Fermentation	(*iv*)	Conversion of phenol to salicyaldehyde

(*a*) A–(*iii*), B–(*i*), C–(*iv*), D–(*ii*) (*b*) A–(*i*), B–(*ii*), C–(*iii*), D–(*iv*)

(*c*) A–(*iii*), B–(*iv*), C–(*i*), D–(*ii*) (*d*) A–(*iv*), B–(*iii*), C–(*i*), D–(*ii*)

45. Which one of the following compound gives a primary amine upon reduction ?

(*a*) $CH_3CH_2NO_2$ (*b*) $CH_3CH_2—O—N=O$

(*c*) $C_6H_4N=NC_6H_5$ (*d*) CH_3CH_2NC

46. Which of the following vitamin is not stored in liver and adipose tissues?

(*a*) Vitamin A (*b*) Vitamin C

(*c*) Vitamin E (*d*) Vitamin K

47. Which is formed by the reduction of RCN with sodium and alcohol?

(*a*) $RCONH_2$ (*b*) $RCOO^-NH_4^+$

(*c*) RCH_2NH_2 (*d*) $(RCH_2)_3N$

48. Which of the following fibres are made of polyamides?

(*a*) Dacron (*b*) Orlon

(*c*) Nylon (*d*) Rayon

49. Correct order of artificial sweetening agents according to sweetness is:

(*a*) Aspartame > Sucralose > Alitame >Saccharin

(*b*) Aspartame > Saccharin > Sucralose > Alitame

(*c*) Alitame > Sucralose > Saccharin > Aspartame

(*d*) Saccharin> Aspartame > Alitame > Sucralose

50. Cannizzaro's reaction is given by

(*a*) acetone (*b*) acetaldehyde

(*c*) benzaldehyde (*d*) acetic acid

Answers

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

Solutions

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1. (*a*) Physical adsorption involves weak force of attraction (like van der Waals' forces) between the adsorbent and the adsorbate. It is reversible in nature and decreases with increase in temperature.

2. (*c*) Since the rate of reaction is independent of concentration of reactant and therefore, the reaction is of zero order.

3. (*b*) Electrolytes are those substances which dissociates into ions when dissolved in water,and ions are responsible for the conduction of electricity.

4. (*c*) Amalgam of mercury with sodium is an example of a solid solution in which solute is liquid mercury (Hg) and solvent is sodium (Na) metal.

5. (*a*) Quartz glass is an amorphous solid and hence it shows isotropy *i.e.*, properties like electrical conductivity, refractive index, thermal expansion etc., are identical in all directions just as in case of gases or liquids.

6. (*b*) Packing efficiency is the percentage of the total space filled by the particles is called packing efficiency.

Packing efficiency of simple cubic cell = 52.4%

Packing efficiency of body centred cubic = 68%

Packing efficiency of hexagonal close packing *hcp*/ face centred cubic close packing (*ccp*) = 74%

7. (*d*) $\text{Molarity} = \dfrac{\text{Number of moles of solute}}{\text{Volume in litre}}$

$$\text{No. of moles of solute} = \frac{\text{Given mass (in g)}}{\text{Molecular mass}}$$

$$\text{Or} \quad \frac{\text{Number of paritcles}}{\text{Avogadro number}} = \frac{\text{Given mass (in g)}}{\text{Molecular mass}}$$

$$\frac{6.02\times10^{22}}{6.022\times10^{23}} = \frac{\text{Given mass}}{180}$$

Given mass $= 0.1 \times 180 = 18$ g

So, number of moles $= \dfrac{18}{180} = 0.1$

Given volume = 50 mL or 50×10^{-3} L

$$\text{Molarity} = \frac{0.1\times1000}{50} = 2$$

8. (*a*) Copper is less reactive than Zn, so, it cannot displace Zn from $ZnSO_4$. Hence, $ZnSO_4$ can stored in copper container.

9. (*b*) For every 10° rise in temperature, the rate constant is nearly doubled.

$\because$ At 300 K, the rate constant is k_1.

$\therefore$ At 280 K, the rate constant will $k_2 = 0.25k_1$.

10. (*c*) Oxidation of ammonia to nitric oxide (Ostwald's process).

$$4NH_3(g) + 5O_2(g) \xrightarrow[800°C]{Pt(s)} 4NO(g) + 6H_2O(g)$$

11. (*d*) An unripe mango placed in a concentrated salt solution shrivel (Shrink) due to outflow of water through semi-permeable membrane due to osmosis.

12. (*a*) Relationship between atomic radius, r (which is $\dfrac{d}{2}$ for crystals of pure elements) and the edge(a) of the unit cell of a cubic crystal are

For simple cubic $r = \dfrac{a}{2}$

For face-centred $r = \dfrac{a}{2\sqrt{2}}$

For body-centred $r = \dfrac{\sqrt{3}}{4}a$

13. (*c*) Any redox reaction would occur spontaneously if the free energy change(ΔG) is negative.

$\Delta G = -nFE^\circ_{cell}$

Where n is the number of electrons involved, F is the value of Faraday and E°_{cell} is the cell emf. ΔG can be negative if the value of E°_{cell} is positive.

14. (*b*) For a first order reaction, $t_{1/2} = \dfrac{0.693}{k}$

Therefore, it is independent of initial concentration of reactants.

15. (*c*)

$$\underset{0}{H_2} + \underset{0}{Br_2} \longrightarrow \underset{+1\ -1}{2HBr}$$

Oxidation

Reduction

Hence, it is redox reaction.

16. (*a*) $E_{H^+/\frac{1}{2}H_2} = E^\circ_{H^+/\frac{1}{2}H_2} - \dfrac{0.0591}{n}\log\dfrac{1}{[H^+]}$

$$= 0 - \frac{0.0591}{1}\log\frac{1}{[H^+]}$$

$$-0.591 = -0.0591 \times \text{pH}$$

$$\text{pH} = \frac{0.591}{0.0591}$$

$$\boxed{\text{pH} = 10}$$

17. (*b*) Alcohols undergo a number of reaction involving the cleavage of C—OH bond. In these reactions, the order of reactivity of alcohols follows the sequence:

Tertiary > Secondary > Primary. Reaction of alcohol with halogen acids is in of the example of this type of cleavage.

18. (*b*) Potash alum is an example of double salt. These salts are the addition compounds which are stable in solid state but break up into constituent ions when dissolved in water or any other solvent. In these compounds the individual properties of constituent are not lost. Some other examples are Mohr's salt, carnallite etc.

19. (*d*) The total number of possible isomers is 4. this can be shown as follows:

(*i*) $[Cu(NH_3)_4]\,[PtCl_4)]$

(*ii*) $[Cu(NH_3)_3Cl]\,[Pt(NH_3)Cl_3]$

(*iii*) $[Pt(NH_3)_3Cl]\,[Cu(NH_3)Cl_3]$

(*iv*) $[Pt(NH_3)_4]\,[CuCl_4]$

20. (*b*) The ore particles which are preferentially wetted by oil stick to the air bubbles, rise to the surface along with the froth. This froth is light and therefore ore particles float.

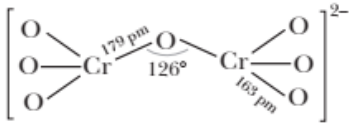
21. (*d*) The salt which is least likely to be found in minerals is nitrate because metal nitrates are highly soluble in water. Due to this high solubility, they are easily washed away by the rain water and get dissolved in the water, which prevents them from forming ores.

22. (*a*) In basic medium, the reaction is

$$MnO_4^- + e^- \longrightarrow MnO_4^{2-}$$

So, 1 electron is involved.

23. (*b*) Structure of dichromate ion $Cr_2O_7^{2-}$ is



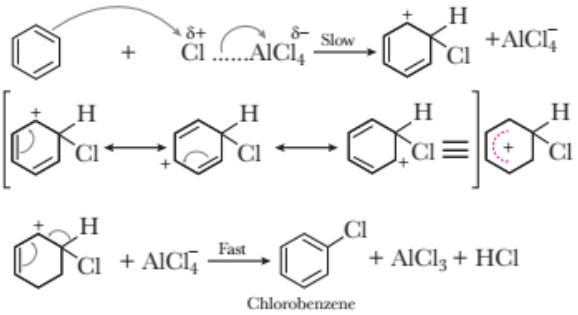
Out of 8, 6 terminal Cr—O bonds are equivalent due to resonance.

24. (*a*) Stereo-isomers related to each other as non-superimposable mirror images are called enantiomers. These possesses identical physical properties. They only differ with respect to the rotation of plane polarised light. If one of the enantiomer is dextrorotatory, the other will be laevorotatory. Structure a is the enantiomer of compound (A). In this structure the position of two groups *i.e.*, CH_3 and C_2H_5 in (*a*) is exactly reversed of the given sample (A) at the chiral carbon.

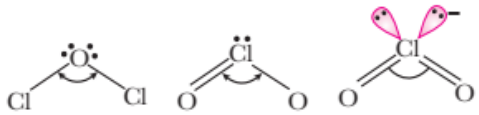
25. (*b*) Formation of chlorobenzene by the reaction of benzene with chlorine in presence of anhydrous $AlCl_3$ is a electrophilic substitution reaction in which Cl^+ an electrophile attacks the benzene ring.

$$Cl—Cl + AlCl_3 \longrightarrow \overset{\delta+}{Cl} \cdots AlCl_4^{\delta-}$$

Electrophile



Chlorobenzene

27. (*a*) 

$ClO_2 > OCl_2 > ClO_2^-$

28. (*a*) As the atomic number increases, atomic size decreases and nuclear charge increases along the axis. Due to which, the first ionisation energy of the first transition series increases.

29. (*c*) Since, on reacting with excess of $AgNO_3$ gives two moles of AgCl precipitate. Therefore, coordination complex must contains two chloride ions. Moreover, one mole of compound produces three moles of ions in the solution. Therefore the correct formula is

$$[Co(NH_3)_5(NO_2)]Cl_2 \rightleftharpoons [Co(NH_3)_5(NO_2)]^{2+} + 2Cl^-$$

31. (*b*) F–F bond dissoication enthalpy is smaller than Cl–Cl due to very small size of F atom and hence the electron-electron repulsions between the lone pairs of electrons are very large.

32. (*a*) Iodoform reaction is given by the compounds having $CH_3CH(OH)$ or CH_3CO group present.

33. (*b*) Glucose, when reacts with excess of phenyl hydrazine, forms crystalline osazone derivative named as glucosazone.

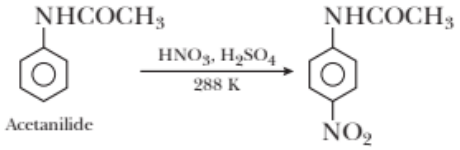
34. (*b*) $CH_3COOH + NaHCO_3 \longrightarrow CH_3COO^-\,Na^+ + H_2O + CO_2\uparrow$

35. (*c*) Antihistamines are drugs which treat allergic rhinitis and other allergies. Diphenhydramine is an antihistamine that reduces the effects of natural chemical histamine in the body. Histamine can produce symptoms of sneezing, itching, watery eyes, and runny nose.

36. (*b*) Copolymerisation is a polymerisation reaction in which a mixture of more than one monomeric species is allowed to polymerise and form a copolymer.

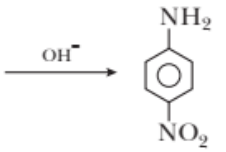
37. (*a*) Methanol is more acidic than water because conjugate base is weaker base than hydroxide ion methoxide ion while other alkoxide ions are stronger base than hydroxide ion.

38. (*b*)



Acetanilide

p-nitroanilide



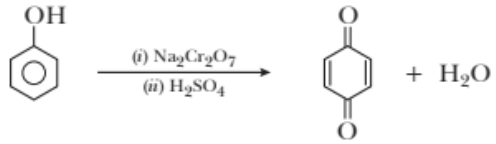
p-nitroaniline

p-nitroaniline is formed in preference to *o*-nitroaniline because para position is less sterically hindered.

39. (*c*) When tertiary alcohols undergo a reaction with a strong oxidizing agent such as $KMnO_4$ at an elevated temperature, various carbon-carbon bonds are cleaved and hence mixture of carboxylic acids containing lesser number of carbon atoms, formed.

40. (*d*) Acetic acid in benzene acts as a dimer due to presence of hydrogen bonding.

41. (*b*)



Benzoquinone

42. (*a*) 'D' configuration refers to all those compounds which can be chemically correlated to D (+) isomer of glyceraldehyde which means —OH group lies on right hand side of the structure.

43. (*a*) $CH_3CH_2CH_2MgBr + CO_2 \longrightarrow C_3H_7COOH + Mg(OH)Br$

45. (*a*)

$$\underset{\text{Nitroethane}}{CH_3CH_2NO_2} + 3H_2 \xrightarrow{\text{Raney Ni}} \underset{\text{Ethylamine}}{CH_3CH_2NH_2} + 2H_2O$$

46. (*b*) It is a water soluble vitamin, readily excreted in urine and cannot be stored in our body.

47. (*c*) $R—CN \xrightarrow{Na/C_2H_5OH} R—CH_2NH_2$

48. (*c*) Nylon possess amide linkage between diamines and dicarboxylic acids or condensation of amino acids or their lactams.

49. (*c*) Alitame is the artificial sweetener that has the highest sweetness value in comparison to cane sugar. The correct order is as follows:

$$\underset{(2000)}{\text{Alitame}} > \underset{(600)}{\text{Sucralose}} > \underset{(550)}{\text{Saccharin}} > \underset{(100)}{\text{Aspartame}}$$

50. (*c*) Aldehydes which do not have an α-hydrogen, undergo self oxidation and reduction (disproportionation) reaction on treatment with concentrated alkali. In this reaction, one molecule of the aldehyde is reduced to alcohol while another is oxidised to carboxylic acid salt.