PRACTICE PAPER 12

CHEMISTRY

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

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

Choose the correct option.

1. **The rate of reaction is doubled for every 10° rise in temperature. The increase in reaction rate as a result of temperature rise from 10° to 100°C will be**
(*a*) 112 (*b*) 512 (*c*) 400 (*d*) 614

2. **When fused NaCl is electrolysed, the reaction occurring at anode is**
(*a*) sodium ions are oxidised. (*b*) chloride ions are oxidised.
(*c*) both sodium and chloride ions are oxidised. (*d*) chloride ions are reduced.

3. **In *hcp* arrangement, the coordination number of each atom is**
(*a*) 4 (*b*) 6 (*c*) 8 (*d*) 12

4. **During osmosis, flow of water through a semipermeable membrane is**
(*a*) from solution having lower concentration only.
(*b*) from solution having higher concentration only.
(*c*) from both sides of semipermeable membrane with equal flow rates.
(*d*) from both sides of semipermeable membrane with unequal flow rates.

5. **Match the compounds given in column I with their magnetic properties given in coloumn II**

Column I	Column II
A. NaCl	(*i*) Antiferromagnetic
B. MnO	(*ii*) Ferromagnetic
C. $CrCl_3$	(*iii*) Paramagnetic
D. CrO_2	(*iv*) Diamagnetic

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

6. **The mole fraction of solute in its one molal aqueous solution will be**
(*a*) 0.108 (*b*) 0.018 (*c*) 0.008 (*d*) None of these

7. **The number of NaCl molecules in the unit cell of the crystal is**
(*a*) 2 (*b*) 4 (*c*) 6 (*d*) 8

8. **Components A and B, respectively of an ideal binary solution. If χ_A represents the mole fraction of component A, the total pressure of the solution will be**
(*a*) $p_A + \chi_A (p_B - p_A)$ (*b*) $p_A + \chi_A (p_A - p_B)$
(*c*) $p_B + \chi_A (p_B - p_A)$ (*d*) $p_B + \chi_A (p_A - p_B)$

9. **Standard electrode potential data are useful for understanding the suitability of an oxidant in redox titrations. Some half cell reactions and their standard electrode potentials are given below:**

$MnO_4^-(aq) + 8H^+ + 5e^- \longrightarrow Mn^{2+}(aq) + 4H_2O(l)$; $E^\circ = 1.51$ V

$Cr_2O_7^{2-}(aq) + 14H^+ + 6e^- \longrightarrow Cr^{3+}(aq) + 7H_2O(l)$; $E^\circ = 1.33$ V

$Fe^{3+}(aq) + e^- \longrightarrow Fe^{2+}(aq)$; $E^\circ = 0.77$ V

$Cl_2(g) + 2e^- \longrightarrow Cl^-(aq)$; $E^\circ = 1.36$ V

Identify the incorrect statement about quantitative estimation of aqueous Fe $(NO_3)_2$:

(*a*) MnO_4^- can be used in aqueous HCl.
(*b*) MnO_4^- can be used in aqueous H_2SO_4.
(*c*) $Cr_2O_7^{2-}$ can be used in aqueous HCl.
(*d*) $Cr_2O_7^{2-}$ can be used in aqueous H_2SO_4.

10. **The conductivity of N/10 KCl solution at 20°C is 0·0212 ohm^{-1} cm^{-1} and the resistance of the cell containing this solution at 20°C is 55 ohm. The cell constant is**

(*a*) 4.616 cm^{-1}
(*b*) 1.166 cm^{-1}
(*c*) 2.173 cm^{-1}
(*d*) 3.324 cm^{-1}

11. **Size of colloidal particles is**

(*a*) $10^{-7} - 10^{-9}$ cm
(*b*) $10^{-9} - 10^{-11}$ cm
(*c*) $10^{-4} - 10^{-7}$ cm
(*d*) $10^{-2} - 10^{-3}$ cm

12. **Enzymes are**

(*a*) substances made by chemists to activate washing powder.
(*b*) very active vegetable catalysts.
(*c*) catalysts found in organisms.
(*d*) synthetic catalysts.

13. **If the specific resistance of a solution of concentration C g eq. litre^{-1} is R, its equivalent conductance is**

(*a*) $\frac{100R}{C}$
(*b*) $\frac{RC}{100}$
(*c*) $\frac{1000}{RC}$
(*d*) $\frac{C}{1000R}$

14. **The solubility of a sparingly soluble salt can be determined by :**

(*a*) Kohlrausch's law
(*b*) Ostwald dilution law
(*c*) Hittorf's method
(*d*) None of these

15. **If the reaction rate at a given temperature becomes slower, then**

(*a*) the free energy of activation is higher.
(*b*) the free energy of activation is lower.
(*c*) the entropy changes.
(*d*) the initial concentration of the reactant remains constant.

16. **The half life of a first order reaction is 693.5 sec. The value of rate constant of the reaction is**

(*a*) 1.0 s^{-1}
(*b*) 0.1 s^{-1}
(*c*) 0.01 s^{-1}
(*d*) 0.001 s^{-1}

17. **Identify the end product (C) is the following sequence:**

$$C_2H_5OH \xrightarrow[\text{Pyridine}]{SOCl_2} (A) \xrightarrow[\text{(alc.)}]{KCN} (B) \xrightarrow{2OH^-/H^+} (C)$$

(*a*) $C_2H_5CH_2NH_2$
(*b*) $C_2H_5CONH_2$
(*c*) $C_2H_5CO_2H$
(*d*) $C_2H_5NH_2 + HCOOH$

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

Statement P : Nickel is purified by reacting it with CO.

Statement Q : Impurities present in nickel form volatile compounds.

(*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

19. **$K_4[Fe(CN)_6]$ is a/an:**

(*a*) double salt (*b*) complex salt

(*c*) acid (*d*) base

20. **Cuprous ion is colourless while cupric ion is coloured because**

(*a*) both have half filled *p*- and *d*-subshell.

(*b*) cuprous ion has incomplete *d*-subshell and cupric ion has a complete *d*-subshell.

(*c*) both have unpaired electrons in the *d*-subshell.

(*d*) cuprous ion has a complete *d*-orbital and cupric ion has an incomplete *d*-subshell.

21. **A compound of a metal ion M^{x+} (Z = 24) has a spin only magnetic moment of $\sqrt{15}$ Bohr Magnetons. The number of unpaired electrons in the compound are**

(*a*) 2 (*b*) 4 (*c*) 5 (*d*) 3

22. $CH_3-\underset{\underset{CH_3}{|}}{C}=CH-CH_3 + \overset{+}{H}\overset{-}{Br} \rightarrow$ **A; 'A' is**

(*a*) $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{Br}{|}}{C}}-CH_2-CH_3$

(*b*) $CH_3-\underset{Br}{\underset{|}{CH}}-\underset{CH_3}{\underset{|}{CH}}-CH_3$

(*c*) $CH_3-\underset{CH_3}{\underset{|}{CH}}-CH_2-CH_2Br$

(*d*) $BrCH_2-\underset{CH_3}{\underset{|}{CH}}-CH_2-CH_3$

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

Assertion (A) : N_2 is less reactive than P_4.

Reason (R) : Nitrogen has more electron gain enthalpy than phosphorus.

(*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.

24. **A gas that cannot be collected over water is**

(*a*) N_2 (*b*) O_2 (*c*) SO_2 (*d*) PH_3

25. **Common oxidation state of scandium, a transition element is/are (At. no. of Sc = 21)**

(*a*) +4 *b*) +1 (*c*) +2 and +3 (*d*) +4 and +1

26. **During the formation of complex entity, the central metal atom/ ion acts as**

(*a*) bronsted acid (*b*) bronsted base (*c*) lewis acid (*d*) lewis base

27. **Oxidation number of gold metal is**

(*a*) +1 (*b*) 0 (*c*) –1 (*d*) all of these

28. **Select the correct statement.**

(*a*) Pyrolusite is an ore of manganese. (*b*) Magnesite is an ore of calcium.

(*c*) Manganite is an ore of iron. (*d*) Siderite is an ore of tin.

29. **Maximum number of compounds are known in the case of**

(*a*) Neon (*b*) Xenon

(*c*) Krypton (*d*) Argon

30. **Which is the correct increasing order of boiling points of the following compounds?**

1-Bromoethane, 1-Bromopropane, 1-Bromobutane, Bromobenzene

(*a*) Bromobenzene < 1-Bromobutane < 1-Bromopropane < 1-Bromoethane

(*b*) Bromobenzene < 1-Bromoethane < 1-Bromopropane < 1-Bromobutane

(*c*) 1-Bromopropane < 1-Bromobutane < 1-Bromoethane < Bromobenzene

(*d*) 1-Bromoethane < 1-Bromopropane < 1-Bromobutane < Bromobenzene

31. **Bleaching powder is formed by the interaction of Cl_2 and**

(*a*) a dilute solution of $Ca(OH)_2$ (*b*) a concentrated solution of $Ca(OH)_2$

(*c*) dry calcium oxide (*d*) dry slaked lime

32. **Which of the following statement is incorrect about peptide bond?**

(*a*) C—N bond length in proteins is longer than usual bond length of C—N bond.

(*b*) C—N bond length in protein is smaller than usual bond length of C—N bond.

(*c*) Spectroscopic analysis shows planar nature of $-\overset{\overset{O}{\|}}{C}-NH-$ group

(*d*) None of these

33. **In the following reaction X is :**

$$X \xrightarrow{\text{Bromination}} Y \xrightarrow{NaNO_2/HCl} Z \xrightarrow[C_2H_5OH]{\text{Boiling}} \text{Tribromobenzene}$$

(*a*) Benzoic acid (*b*) Salicylic acid

(*c*) Phenol (*d*) Aniline

34. **Arrange the following compounds in the decreasing order of their reactivity towards nucleophilic addition reaction.**

(I) $C_6H_5COCH_3$ **(II)** CH_3COCH_3

(III) C_6H_5CHO **(IV)** $Cl—CH_2–CHO$

(*a*) IV > III > II > I (*b*) IV > II > III > I

(*c*) I > II > III > IV (*d*) III > IV > II > I

35. **Which of the following is correct about hydrogen bonding in nucleotide?**

(*a*) A—T; G—C (*b*) A—G; T—C

(*c*) G—T; A—C (*d*) A—A; T—T

36. **A chemical substance which cures some disease, is safe to use, and has negligible toxicity, is known as:**

(*a*) medicine (*b*) drug

(*c*) enzymes (*d*) antioxidants

37. **Which is not true about polymers?**

(*a*) Polymers do not carry any charge. (*b*) Polymers have high viscosity.

(*c*) Polymers scatter light. (*d*) Polymers have low molecular weight.

38. **The reaction** $R—CH_2—CH_2—COOH \xrightarrow[Br_2]{RedP} R—CH_2—\underset{\underset{Br}{|}}{CH}—COOH$ **is known as**

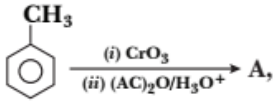
(*a*) Reimer — Tieman Reaction (*b*) Hell–Volhard–Zelinsky reaction

(*c*) Cannizzaro's reaction (*d*) Sandmeyer reaction

39. **Butylated hydroxyl toluene as a food additive acts as**

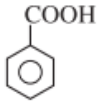
(*a*) antioxidant (*b*) flavouring agent

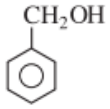
(*c*) colouring agent (*d*) emulsifier

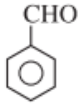
40. 

A, product 'A' is

(*a*) 

(*b*) 

(*c*) 

(*d*) 

41. **Nucleic acids are the polymers of _____.**

(*a*) nucleosides (*b*) nucleotides

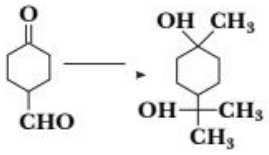
(*c*) bases (*d*) sugars

42. **Monochlorination of toluene in sunlight followed by hydrolysis with aq. NaOH yields**

(*a*) *o*-Cresol (*b*) *m*-Cresol

(*c*) 2, 4-Dihydroxytoluene (*d*) Benzyl alcohol

43. **The correct sequence of reagents for the following conversion will be**



(*a*) $[Ag(NH_3)_2]^+ OH^-, H^+/CH_3OH, CH_3MgBr$ (*b*) $CH_3MgBr, H^+/ CH_3OH, [Ag(NH_3)_2]^+ OH^-$

(*c*) $CH_3MgBr, [Ag(NH_3)_2]^+ OH^-, H^+/CH_3OH$ (*d*) $[Ag(NH_3)_2]^+ OH^-, CH_3MgBr, H^+/CH_3OH$

44. **Which of the following contains isoprene units?**

(*a*) Natural rubber (*b*) Nylon-66

(*c*) Polyethylene (*d*) Dacron

45. **Which of the following hormones regulate the glucose level in the blood?**

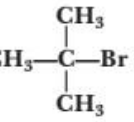
(*a*) Insulin (*b*) Glucagon

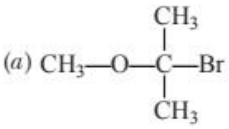
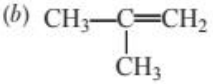
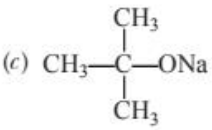
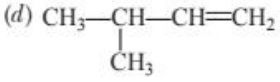
(*c*) Epinephrine (*d*) Both (*a*) and (*b*)

46. **When aniline is treated with sodium nitrite and hydrochloric acid at 0°C, it gives:**

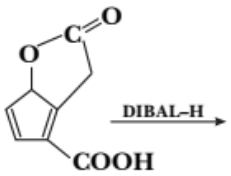
(*a*) phenol and N_2 (*b*) diazonium salt

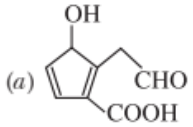
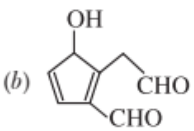
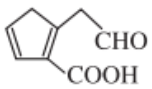
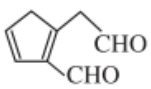
(*c*) hydrazo compound (*d*) no reaction occurs

47. **The reaction of**  **with $NaOCH_3$ forms the product,**

(*a*)  (*b*)  (*c*)  (*d*) 

48. **The major product obtained in the following reaction is**



(*a*)  (*b*)  (*c*)  (*d*) 

49. **An alcohol on oxidation is found to give CH_3COOH and CH_3CH_2COOH. The structure of the alcohol is:**

(*a*) $CH_3CH_2CH_2OH$ (*b*) $(CH_3)_2C(OH)CH_2—CH_3$

(*c*) $CH_3(CH_2)_3CH_2OH$ (*d*) $CH_3CH(OH)CH_2CH_2CH_3$

50. **The correct order of increasing basic strengths in aqueous solution is**

(*a*) $NH_3 < CH_3NH_2 < (CH_3)_2NH$ (*b*) $CH_3NH_2 < (CH_3)_2NH < NH_3$

(*c*) $CH_3NH_2 < NH_3 < (CH_3)_2NH$ (*d*) $(CH_3)_2NH < NH_3 < CH_3NH_2$

Answers

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

Solutions

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1. (*b*) For a 10°C ⟶ 100°C, there is 9 times increase in temperature.

$\therefore$ Rate $= (2)^9 = 512$ times.

2. (*b*) During electrolysis of molten NaCl, sodium metal is obtained at the cathode(by reduction of sodium ions) and chlorine gas is obtained at the anode(by oxidation of chloride ions).

At Cathode: $Na^+ + e^- \longrightarrow Na$

At Anode:

$Cl^- \longrightarrow Cl + e^-$ (Primary change)

$Cl + Cl \longrightarrow Cl_2$ (Secondary change)

3. (*d*) The hexagonal closed packed (*hcp*) has a coordination number of 12 and contains 6 atoms per unit cell.

4. (*d*) Osmosis is the phenomenon of flow of pure solvent from the solvent to the solution or from a less concentrated solution to a more concentrated solution through a semipermeable membrane. Common semipermeable membranes are permeable to certain solute particles also. Infact, there is no perfect semipermeable membrane. Therefore we can say that flow of water through a semipermeable membrane takes place both sides with unequal rates.

6. (*b*) $$\chi_A = \frac{n_A}{n_A + n_B}$$

$$n_A = 1, \quad n_B = \frac{1000}{18} = 55.55$$

$$\chi_A = \frac{1}{1 + 55.55} = \frac{1}{56.55} = 0.018$$

7. (*b*) There are a total of four formula units of NaCl per unit cell, *i.e.*, $4Na^+$ and $4Cl^-$ ions.

$$Na^+ \text{ ions} = 12 \times \underset{\text{(edges)}}{\frac{1}{4}} + \underset{\text{(body centre)}}{1} = 4$$

$$Cl^- \text{ ions} = \underset{\text{(corners)}}{8 \times \frac{1}{8}} + \underset{\text{(face centre)}}{\frac{1}{2} \times 6} = 4$$

8. (*d*) According to Raoult's law,

$$p = \chi_A p_A + \chi_B p_B \ldots (i)$$

for Binary solutions,

$$\chi_A + \chi_B = 1$$

$$\chi_B = 1 - \chi_A \quad \ldots (ii)$$

Putting value of χ_B from equation (*ii*) into equation (*i*), we get

$$p = \chi_A p_A + (1 - \chi_A) p_B$$

$$= \chi_A p_A + p_B - \chi_A p_B$$

$$p = p_B + \chi_A (p_A - p_B)$$

9. (*a*) MnO_4^- cannot be used for oxidation of Fe^{2+} in HCl medium because the following reaction is spontaneous.

$$MnO_4^- + Cl^- \longrightarrow Mn^{2+} + Cl_2;$$

$$E^\circ_{cell} = 1.51 - 1.40 = 0.11\ V$$

Thus, in aq. HCl, MnO_4^- will not only oxidise Fe^{2+} to Fe^{3+} but will also oxidise Cl^- to Cl_2. Whereas all other reactions are feasible. Hence, MnO_4^- in HCl is not a suitable reagent.

10. (*b*) Resistance (R) = 55 ohm

$$\text{Conductance } (G) = \frac{1}{R}$$

Specific conductance = 0.0212 $ohm^{-1}\,cm^{-1}$

Specific conductance

= Conductance (G) × Cell constant

$$\text{cell constant} = \frac{\text{Specific conductance}}{\text{Conductance}}$$

$= 0.0212 \times 55$

$= 1.166\ cm^{-1}$

11. (*c*) In colloids,the size of dispersed particles range between 1 nm and 1000 nm (*i.e.*, 10^{-4}–10^{-7} cm)

12. (*c*) Enzymes are complex nitrogenous organic compounds produced in living cells of plants and animals.

13. (*c*)

$$\text{Equivalent conductance} = \frac{\text{Specific conductance} \times 1000}{\text{Concentration}}$$

$$= \frac{\kappa \times 1000}{C}$$

Here, $\rho = R$ and $\kappa = \frac{1}{\rho}$

So, $\kappa = \frac{1}{R}$

$$= \frac{1000}{CR}$$

14. (*a*) The application of Kohlrausch's law and conductance measurement helps us to determine solubility of sparingly soluble salts.

15. (*a*) Since, $k = Ae^{-E_a/RT}$

Thus, if the reaction rate at a given temperature becomes slower, then the energy of activation will be higher.

16. (*d*) For first order reaction, $t_{1/2} = \frac{0.693}{k}$

Therefore, $k = \frac{0.693}{693.5} = 0.00099 \simeq 0.001\,s^{-1}$

17. (*c*) $C_2H_5OH \xrightarrow[\text{pyridine}]{SOCl_2} C_2H_5Cl \xrightarrow{KCN(alc.)}$

$C_2H_5CN \xrightarrow{2OH^-/H^+} C_2H_5COOH$

18. (*a*) CO forms a volatile compound with nickel. The volatile compound formed is called $Ni(CO)_4(g)$. Thus, statement P is true but statement Q is false.

19. (*b*) Complex ion is the species formed by linking of a number of ions or molecules by coordinate bonds to the central metal atom/ion carries positive or negative charge. The compounds containing this type of ion is called as complex salt.

20. (*d*) The electronic configuration of copper:

Cu (Z = 29) : [Ar] $3d^{10}\,4s^1$

Cu^+ : [Ar] $3d^{10}$

Cu^{2+}: [Ar] $3d^9$

Since, Cu^+ has fully filled *d*-subshell, therefore it is colourless while Cu^{2+} has partly filled *d*-subshell and hence it is blue in colour.

21. (*d*) The spin only magnetic moment can be calculated as

$\mu = \sqrt{n(n+2)} = \sqrt{15}$

$\therefore\ n(n+2) = 15$

As $n > 0$, $\therefore\ n = 3$

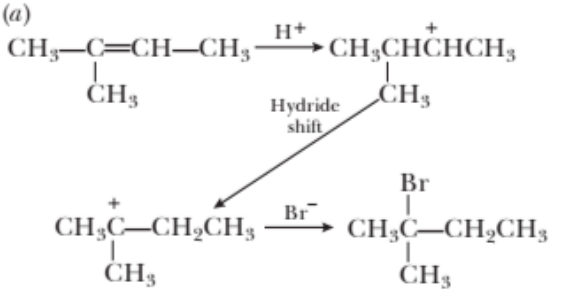
According to the given atomic no., the ion can be

M(Z = 24) : [Ar] $3d^5\,4s^1$

M^{3+} or Cr^{3+} : [Ar] $3d^3$

Thus, ion has 3 unpaired electrons.

22. (*a*)



2-bromo-2-methylbutane

23. (*c*) Assertion is correct statement but reason is wrong statement. The correct reason is "Due to high value of bond dissociation energy which is because of presence of triple bond between two N-atoms of nitrogen molecule, N_2 is less reactive than P_4.

24. (*c*) Sulphur dioxide is colourless gas with pungent smell and is highly soluble in water.

25. (*c*) Sc(Z = 21) has electronic configuration [Ar] $3d^1\,4s^2$. So, common oxidation states can be +2 and +3.

26. (*c*) Central metal ions in the complex compounds have vacant *d*-orbitals. They accepts the lone pair of electrons from ligands. Therefore, they act as Lewis acid.

27. (*a*) Oxidation number of gold metal is +1. The electronic configuration of Au is [Xe] $4f^{14}\,5d^{10}\,6s^1$.

28. (*a*) Pyrolusite (MnO_2) is an important ore of manganese. The other correct statements are as follows:

Magnesite is an ore of magnesium.

Manganite is an ore of manganese.

Siderite is an ore of iron.

29. (*b*) Xenon forms maximum number of compounds because, Xe has the lowest ionization enthalpy among noble gases and hence can be easily oxidised by strong oxidising agents like O_2 and F_2.

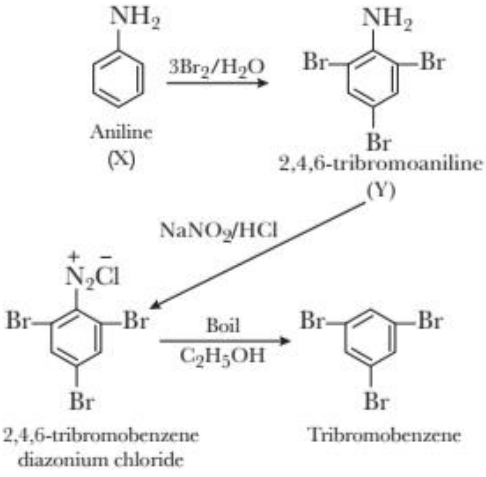
30. (*d*) Boiling point increases with increase in the size of the hydrocarbon part for the same haloalkanes. All the given haloalkanes contain the same halogen atom *i.e.*, bromine but the number of carbon atoms in the hydrocarbon part of the molecule is increasing from ethane to benzene.

Therefore, the boiling point is minimum for 1-bromoethane and maximum for 1-bromobenzene.

31. (*d*) Bleaching powder is obtained by the interaction of Cl_2 with a dry slaked lime.

32. (*a*) The $(C—N)_{protein} < (C—N)_{usual}$ due to partial double bond character in case of amino acid.

33. (*d*)



34. (*a*) Firstly ketones are less reactive towards nucleophilic addition reaction than aldehyde due to presence of two electron releasing alkyl groups which makes carbon less electron deficient. Secondly, aromatic aldehyde and ketones are less reactive than aliphatic aldehyde and ketone due to resonance effect. Since, Cl is more electronegative and therefore the correct order is

$$\underset{IV}{Cl—CH_2—CHO} > \underset{III}{C_6H_5CHO} > \underset{II}{CH_3COCH_3} > \underset{I}{C_6H_5COCH_3}$$

35. (*a*) Adenine forms hydrogen bonds with thymine whereas cytosine forms hydrogen bonds with guanine.

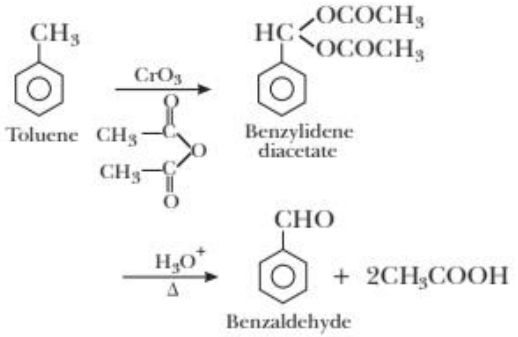
36. (*a*) A medicine is the substance which cures the disease, is safe to use, has negligible toxicity and doesn't cause addiction. Also, chemical substances of natural or synthetic origin which are used for curing disease and reducing suffering from pain are medicines.

37. (*d*) Polymers generally have high molecular masses.

38. (*b*) In HVZ reaction, carboxylic acids having α-hydrogen are halogenated at the α-position on treatment with chlorine or bromine in the presence of red phosphorus to give α-halocarboxylic acids.

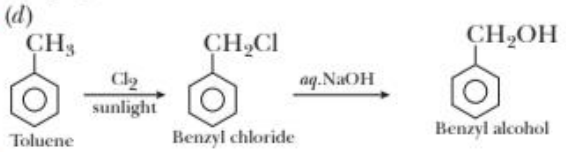
39. (*a*) Butylated hydroxytoluene (BHT), also known as dibutylhydroxytoluene, is a lipophilic organic compound, chemically a derivative of phenol, that is useful for its antioxidant properties.

40. (*d*)

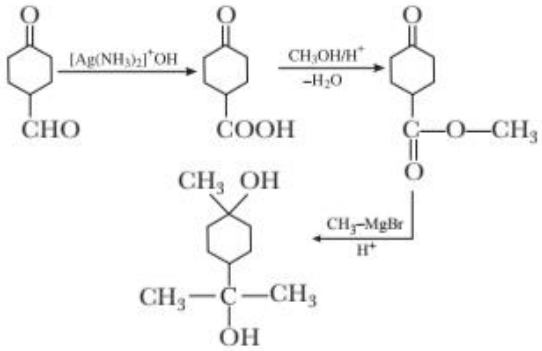


41. (*b*) Since nucleic acids are long chain polymers of nucleotides, so they are also called polynucleotides.

42. (*d*)



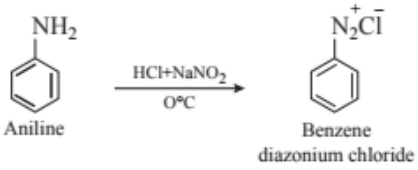
43. (*a*)



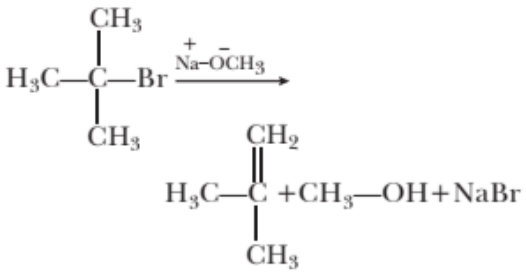
44. (*a*) Natural rubber may be considered as a linear polymer of isoprene (2-methyl-1, 3-butadiene) and is also called as *cis*-1, 4 - polyisoprene.

45. (*d*) Insulin is released in response to the rapid rise in blood glucose level. On the other hand hormone glucagon tends to increase the glucose level in the blood.

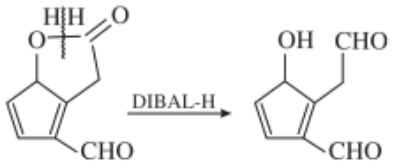
46. (*b*)



47. (*b*)



48. (*b*) DIBAL — H is an electrophilic reducing agent and mainly reduces esters, lactones, amides, cyanides and carboxylic acid into aldehydes.



49. (*d*) Since the secondary alcohol on oxidation gives two different acids, acetic acid and propionic acid, the alcohol is secondary alcohol and will contain 5 C atoms.

50. (*a*) In aqueous solution, the basicity of amine depends on inductive effect and solvation effect. Thus, the correct increasing order is

$NH_3 < 1°$ amine $< 3°$ amine $< 2°$ amine