Q1. In the Arrhenius equation, when log k is plotted against 1/T, a straight line is obtained whose: **1 Mark**

A slope is $\frac{A}{R}$ and intercept is E_a.
B slope is A and intercept is $\frac{-E_a}{R}$
C slope is $\frac{-E_a}{RT}$ and intercept is log A.
D slope is $\frac{-E_a}{2{:}303\,R}$ and intercept is log A.

Q2. For Questions two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1**
Assertion (A): Ammonolysis of alkyl halides is not a suitable method for the preparation of pure primary amines.
Reason (R): Ammonolysis of alkyl halides yields mainly secondary amines.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q3. $\triangle G$ and E°_{cell} for a spontaneous reaction will be: **1**

A Positive, negative **B** Negative, negative **C** Negative, positive **D** Positive, positive

Q4. Which of the following compounds would be hydrolysed by aqueous KOH most easily? **1**

A $CH_2 = CH - Br$
B $CH_3 - CH_2 - Br$
C $CH_3 - \underset{\displaystyle Br}{\underset{|}{CH}} - CH_3$
D $CH_2 = CH - CH_2 - Br$

Q5. An electrochemical cell behaves like an electrolytic cell when: **1**

A $E_{cell} = E_{external}$. **B** $E_{cell} = 0$. **C** $E_{external} > E_{cell}$. **D** $E_{external} < E_{cell}$.

Q6. Which of the following is the softest metal? **1**

A Zn **B** Sc **C** Cu **D** Fe

Q7. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**
Assertion (A): Non-ideal solutions form azeotropic mixture.
Reason (R): Maximum boiling azeotropes are formed by a solution showing negative deviation.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is correct, but Reason (R) is incorrect statement.

Q8. Which of the following complexes shows geometrical isomerism? **1**

A $[Co(NH_3)_6]^{3+}$ **B** $[Co(NH)_3Cl]^{2+}$ **C** $[Co(NH)_3Cl_2]^{+}$ **D** $[Co(NH)_3(ONO)]^{2+}$

Q9. In a lead storage battery: **1**

A PbO_2 is reduced to $PbSO_4$ at the cathode.
B Pb is oxidised to $PbSO_4$ at the anode.
C Both electrodes are immersed in the same aqueous solution of H_2SO_4.
D All the above are true.

Q10. **Assertion (A):** Transition metals have high melting point.
Reason (R): Transition metals have completely filled d-orbitals.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q11. A galvanic cell can behave like an electrolytic cell when: **1 Mark**

A $E_{cell} = E_{ext}$ **B** $E_{ext} = E_{cell}$ **C** $E_{cell} > E_{ext}$ **D** $E_{cell} = 0$

Q12. Which of the following is correct for spontaneity of a cell? **1**

A $\Delta G = -ve\ E^0 = +ve$

B $\Delta G = +ve\ E^0 = 0$

C $\Delta G = -ve\ E^0 = 0$

D $\Delta G = +ve\ E^0 = -ve$

Q13. **Assertion (A):** F_2 has lower bond dissociation enthalpy than Cl_2. **1**
Reason (R): Fluorine is more electronegative than chlorine.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q14. Which one of the following first row transition elements is expected to have the highest third ionization enthalpy? **1**

A Iron (Z = 26) **B** Manganese (Z = 25) **C** Chromium (Z = 24) **D** Vanadium (Z = 23)

Q15. $\alpha - D(+)$ glucose and $\beta - D(+)$ glucose are: **1**

A Geometrical isomers. **B** Enantiomers. **C** Anomers. **D** Optical isomers.

Q16. Two among the three components of DNA are -D-2-deoxyribose and a heterocyclic base. The third component is: **1**

A Adenine **B** Phosphoric acid **C** Sulphuric acid **D** Uracil

Q17. For Questions two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1**
Assertion (A): $(C_2H_5)_2NH$ is more basic than $(C_2H_5)_3N$ in aqueous solution.
Reason (R): In $(C_2H_5)_2NH$, there is more steric hindrance and +I effect than $(C_2H_5)_3N$.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q18. **Assertion (A):** Conductivity of an electrolyte increases with decrease in concentration. **1**
Reason (R): Number of ions per unit volume decreases on dilution.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q19. The crystal field splitting energy for octahedral (Δ_0) and tetrahedral (Δ_t) complexes is related as: **1 Mark**

A $\Delta_t = \frac{2}{9}\Delta_0$

B $\Delta_t = \frac{5}{9}\Delta_0$

C $\Delta_t = \frac{4}{9}\Delta_0$

D $\Delta_t = 2\Delta_0$

Q20. Which of the following is a non-reducing sugar? **1 Mark**

A Sucrose. **B** Maltose. **C** Glucose. **D** Lactose.

Q21. Which among the following is a false statement? **1 Mark**

A Rate of zero order reaction is independent of initial concentration of reactant.
B Half-life of a zero order reaction is inversely proportional to the rate constant.
C Molecularity of a reaction may be zero.
D For a first order reaction, $t_{\frac{1}{2}} = \frac{0.693}{k}$

Q22. The conversion of an alkyl halide into an alcohol by aqueous NaOH is classified as: **1 Mark**

A A dehydrohalogenation reaction.
B A substitution reaction.
C An addition reaction.
D A dehydration reaction.

Q23. The glycosidic linkage involved in linking the glucose units in amylase part of starch is: **1 Mark**

A C_1 - C_6 α linkage
B C_1 - C_6 β linkage
C C_1 - C_4 α linkage
D C_1 - C_4 β linkage

Q24. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**
Assertion (A): The complex $[Cr(H_2O)_3Cl_3]$ does not give precipitate with $AgNO_3$ solution.
Reason (R): The complex $[Cr(H_2O)_3Cl_3]$ is non-ionizable.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is correct, but Reason (R) is incorrect statement.

Q25. Which of the following solutions will have the highest boiling point in water? **1**

A 1% KCl **B** 1% glucose **C** 1% urea **D** 1% $CaCl_2$

Q26. Which of the following is a disaccharide? **1**

A Glucose. **B** Starch. **C** Cellulose. **D** Lactose.

Q27. The slope in the plot of ln [R] Vs. time gives. **1**

A $+k$
B $\frac{+k}{2.303}$
C $-k$
D $\frac{-k}{2.303}$

Q28. Which of the following haloalkanes react with aqueous KOH most rapidly by S_N1 reaction? **1**

A 2-Chlorobutane
B 1-Bromobutane
C 2-Bromo-2-Methylpropane
D 2,2-Dimethyl-1-Chloropropane

Q29. Racemisation occurs in: **1**

A S_N2 reaction.
B S_N1 reaction.
C Neither S_N2 nor S_N1 reactions.
D SN2 reaction as well as S_N1 reaction.

Q30. An $\alpha-$helix is a structural feature of: **1**

A Sucrose. **B** Polypeptides. **C** Nucleotides. **D** Starch.

Q31. A first order reaction takes 30 minutes for 50% completion. The value of rate constant k would be: **1**

A 2.5×10^{-3} min^{-1} **B** 2.75×10^{-4} min^{-1} **C** 1.25×10^{-3} min^{-1} **D** 2.31×10^{-3} min^{-1}

Q32. The reagent that can be used to convert benzenediazonium chloride to benzene is: **1**

A Cu/ HCl **B** H_2O **C** CH_3CH_2OH **D** CuCN

Q33. **Assertion (A):** 0.1M solution of KCl has greater osmotic pressure than 0.1M solution of glucose at same temperature. **1 Mark**
Reason (R): In solution, KCl dissociates to produce more number of particles.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is wrong statement.
D Assertion (A) is wrong, but Reason (R) is correct statement.

Q34. Out of the following transition elements, the maximum number of oxidation states are shown by: **1 Mark**

A Sc (Z = 21) **B** Cr (Z = 24) **C** Mn (Z = 25) **D** Fe (Z = 26)

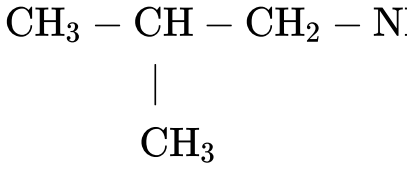
Q35. Zinc is coated over iron to prevent rusting of iron because: **1 Mark**

A $E^\circ_{Zn^{2+}/Zn} = E^\circ_{Fe^{2+}/Fe}$ **B** $E^\circ_{Zn^{2+}/Zn} < E^\circ_{Fe^{2+}/Fe}$

C $E^\circ_{Zn^{2+}/Zn} > E^\circ_{Fe^{2+}/Fe}$ **D** None of these.

Q36. Which of the following amines does not give foul smell of isocyanide on heating with chloroform and ethanolic KOH? **1 Mark**

A $CH_3 - CH_2 - NH_2$

B 

C $(CH_3 — CH_2)_3N$

D

Q37. Which of the following complexes show linkage isomerism? **1**

A $[Co(NH_3)_5Cl]^{2+}$ **B** $[Co(NH_3)_4Cl_2]Br_2$ **C** $[Co(H_2O)_6]^{3+}$ **D** $[Co(NH_3)_5(ONO)]^{2+}$

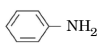
Q38. Which of the following transition metals has the highest melting point? **1**

A Sc **B** Cr **C** Mn **D** Zn

Q39. In a Leclanche dry cell, the cathode is: **1**

A Zn container **B** MnO_2 **C** Graphite rod **D** NH_4Cl

Q40. Which of the following is least basic? **1**

A $(CH_3)_2NH$ **B** NH_3 **C**  **D** $(CH_3)_3N$

Q41. 'Which by-product is obtained in the manufacture of phenol from cumene? **1**

A Acetaldehyde **B** Acetone **C** Anisole **D** o-Cresol

Q42. **Directions:** In question number 13 and 16, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion (A): The bond angle C - O - C in ethers is slightly greater than tetrahedral angle.

Reason (R): This is because of the repulsive interaction between the two bulky alkyl groups.

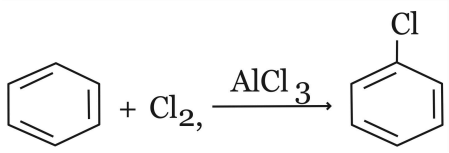
A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q43. The species that attacks benzene in following is: **1**



A CI^- **B** $AICI_4^-$ **C** $AICI_3$ **D** CI^+

Q44. With increase in atomic number, the melting point of transition metals: **1**

A first increases and then decreases **B** increases continuously

C first decreases and then increases **D** remains constant

Q45. **Assertion (A):** Oxidation of ketones is easier than aldehydes. **1 Mark**

Reason (R): C-C bond of ketones is stronger than C-H bond of aldehydes.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q46. Assertion (A) is followed by a statement of Reason (R). Choose the correct option: **1 Mark**

Assertion (A): For measuring resistance of an ionic solution an AC source is used.

Reason (R): Concentration of ionic solution will change if DC source is used.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q47. The correct order of the ease of dehydration of the following alcohols by the action of conc. H_2SO_4 is: **1 Mark**

A $(CH_3)_3C-OH > (CH_3)_2CH-OH > CH_3CH_2-OH$

B $(CH_3)_2CH-OH > CH_3CH_2-OH > (CH_3)_3C-OH$

C $CH_3CH_2-OH > (CH_3)_2CH-OH > (CH_3)_3C-OH$

D $(CH_3)_2CH-OH > (CH_3)_3C-OH > CH_3CH_2-OH$

Q48. The freezing point of one molal KCl solution, assuming KCl to be completely dissociated in water, is : (K_f for water = 1.86K kg mol^{-1}). **1**

A -3.72°C **B** +3.72°C **C** -1.86°C **D** +2.72°C

Q49. On the basis of crystal field theory, electronic configuration of d^4 complex when $\Delta_0 > P$ is: **1**

A $t_{2g}3e_g1$ **B** $t_{2g}2e_g2$ **C** $t_{2g}1e_g3$ **D** $t_{2g}4e_g0$

Q50. Amino acids are: **1**

A Acidic. **B** Basic. **C** Amphoteric. **D** Neutral.

Q51. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**

Assertion (A): Linkage isomerism arises in coordination compounds because of ambidentate ligand.

Reason (R): Ambidentate ligand like NO_2 has two different donor atoms i.e., N and O.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is incorrect statement.

D Assertion (A) is incorrect, but Reason (R) is correct statement.

Q52. In an electrochemical cell, the following reaction takes place: **1**

$2Ag^+(aq) + Mg(s) \rightarrow 2Ag(s) + Mg^{2+}(aq)$

$E^\circ_{cell} = 2.96V$

As the reaction progresses, what will happen to the overall voltage of the cell?

A Voltage will remain constant.

B It will decrease as $[Mg^{2+}]$ increases.

C It will decrease as $[Ag^+]$ increases.

D It will decrease as $[Mg^{2+}]$ increases.

Q53. 'Which reagents are required for one step conversion of Chlorobenzene to Diphenyl? **1**

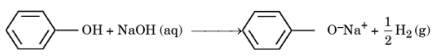
A Chlorobenzene, Na, Dry ether

B Benzene, Anhydrous $AlCl_3$

C Chlorobenzene/ Fe, Dark

D $NaNO_2$ + HCl

Q54. The reaction **1**



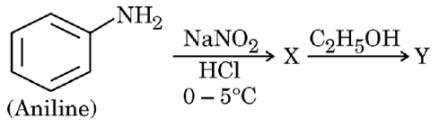
suggests that phenol are:

A Basic **B** Neutral **C** Acidic **D** Amphoteric

Q55. Which one is the complementary base of cytosine in one strand to that in other strand of DNA? **1 Mark**

A Adenine. **B** Guanine. **C** Thymine. **D** Uracil.

Q56. In the given reaction sequence, the structure of Y would be: **1 Mark**



A 

B 

C 

D 

Q57. The colligative property used for the determination of molar mass of polymers and proteins is: **1 Mark**

A Osmotic pressure
B Depression in freezing point
C Relative lowering in vapour pressure
D Elevation is boiling point

Q58. On dissolving ammonium chloride in water at room temperature, the solution feels cool to touch. Under which of the following conditions does salt dissolve faster? **1 Mark**

A Powdered salt in cold water
B Powdered salt in hot water
C Salt crystals in cold water
D Salt crystals in hot water

Q59. If the standard electrode potential of an electrode is greater than zero, then we can infer that its: **1**

A Reduced form is more stable compared to hydrogen gas.
B Oxidised form is more stable compared to hydrogen gas.
C Reduced and oxidised forms are equally stable.
D Reduced form is less stable than the hydrogen gas.

Q60. CH_3CONH_2 on reaction with NaOH and Br_2 in alcoholic medium gives: **1**

A $CH_3CH_2NH_2$ **B** CH_3CH_2Br **C** CH_3NH_2 **D** CH_3COONa

Q61. The rate constant for a first order reaction is equal to the initial rate of reaction when the initial concentration of the reactant is: **1**

A $1 \times 10^{-2}M$ **B** 1M **C** 10M **D** 0.1M

Q62. Out of Ti^{3+}, Cr^{3+}, Mn^{2+} and Ni^{2+} ions, the one which has the highest magnetic moment is: **1**

A Ti^{3+} **B** Cr^{3+} **C** Mn^{2+} **D** Ni^{2+}

Q63. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**
Assertion (A): Sucrose is a non-reducing sugar.
Reason (R): Sucrose has glycosidic linkage.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is incorrect, but Reason (R) is correct statement.

Q64. The unit of rate and rate constant are same for a: **1**

A First order reaction **B** Second order reaction **C** Zero order reaction **D** Third order reaction

Q65. Assertion (A) is followed by a statement of Reason (R). Choose the correct option: **1**
Assertion (A): Henry's law constant (Kp) decreases with increase in temperature.
Reason (R): As the temperature increases, solubility of gases in liquids decreases.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q66. Furanose ring of fructose is formed due to reaction between: **1**

A C_1 and C_5 **B** C_2 and C_5 **C** C_1 and C_4 **D** C_1 and C_2

Q67. The amount of electricity required to produce one mole of Zn from $ZnSO_4$ solution will be: **1 Mark**

A 3F **B** 2F **C** 1F **D** 4F

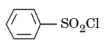
Q68. One mole of $CrCl_3.6H_2O$ compound reacts with excess $AgNO_3$ solution to yield two moles of AgCl(s). The structural formula of the compound is: **1 Mark**

A $[Cr(H_2O)_5Cl]Cl_2.H_2O$ **B** $[Cr(H_2O)_3Cl_3].3H_2O$ **C** $[Cr(H_2O)_4Cl_2]Cl.2H_2O$ **D** $[Cr(H_2O)_6]Cl_3$

Q69. Which of the following complex ion is not optically active? **1 Mark**

A $[Co(ox)_3]^{3-}$ **B** cis-$[Co(en)_2Cl_2]^+$ **C** trans-$[Co(en)_2Cl_2]^+$ **D** $[Co(en)_3]^{3+}$

Q70. In the Hinsberg's method for separation of primary, secondary and tertiary amines, the reagent used is: **1 Mark**

A Nitrous acid **B** $CHCl_3$ + aq. NaOH **C**  **D** HCl/ $ZnCl_2$

Q71. **Assertion (A):** Cuprous salts are diamagnetic. **1 Mark**
Reason (R): Cuprous ion has completely filled 3d-orbitals.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q72. Kohlrausch given the following relation for strong electrolytes: **1**
$\wedge = \wedge_0 - \mathrm{A}\sqrt{\mathrm{C}}$
Which of the following equality holds?

A $\wedge = \wedge_0 \text{ as } \mathrm{C} \to \sqrt{\mathrm{A}}$
B $\wedge = \wedge_0 \text{ as } \mathrm{C} \to \infty$
C $\wedge = \wedge_0 \text{ as } \mathrm{C} \to 0$
D $\wedge = \wedge_0 \text{ as } \mathrm{C} \to 1$

Q73. At low temperature, phenol reacts with Br_2 in CS_2 to form: **1**

A 2,4,6-tribromophenol **B** p-bromophenol **C** o-and p-bromophenol **D** 2,4-dibromophenol

Q74. The best reagent for converting propanamide into propanamine is **1**

A excess H_2
B Br_2 in aqueous NaOH
C iodine in the presence of red phosphorus
D $LiAlH_4$ in ether

Q75. Which of the following transition metal ion is not coloured? **1**

A cu^+ **B** Ni^{2+} **C** Co^{2+} **D** v^{3+}

Q76. $Ag^+(aq) + e^- \rightarrow Ag\ (s)\ \ E° = +0.80\ V$ **1**
$Fe2+\ (aq) + 26^- \rightarrow Fe\ (s)\ E° = -0.44\ V$
Find the E°cell for:
$Fe\ (s) + 2Ag^+\ (aq) \rightarrow Fe^{2+}\ (aq) + 2Ag\ (s)$

A 1.6V **B** -1.16 V **C** 2.04 V **D** 1.24 V

Q77. The oxidation state of Ni in $[Ni(CO)_4]$ is: **1**

A 0 **B** 2 **C** 3 **D** 4

Q78. What amount of electric charge is required for the reduction of 1 mole of MnO^-_4 into Mn^{2+}? **1**

A 1F **B** 5F **C** 4F **D** 6F

Q79. An unripe mango placed in a concentrated salt solution to prepare pickle, shrivels because. **1**

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

Q80. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**
Assertion (A): The molecularity of the reaction H2 + Br_2 → 2HBr appears to be 2.
Reason (R): Two molecules of the reactants are involved in the given elementary reaction.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is incorrect, but Reason (R) is correct statement.

Q81. The primary and secondary valences of Co in $[Co(en)_3]Cl_3$ respectively are : **1 Mark**

A 3, 3 **B** 0, 3 **C** 6, 3 **D** 3, 6

Q82. **Assertion (A):** Hydrolysis of an ester follows first order kinetics. **1 Mark**
Reason (R): Concentration of water remains nearly constant during the course of the reaction.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is wrong statement.
D Assertion (A) is wrong, but Reason (R) is correct statement.

Q83. Which of the following properties of transition metals enables them to behave as catalysts? **1 Mark**

A High melting point
B High ionisation enthalpy
C Alloy formation
D Variable oxidation states

Q84. For Questions two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1**
Assertion (A): EDTA is used to determine hardness of water.
Reason (R): EDTA is a bidentate ligand.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q85. **Directions:** In question number 13 and 16, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**
Assertion (A): Molecularity of reaction is determined experimentally.
Reason (R): Molecularity is applicable only for an elementary reaction and not for a complex reaction.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q86. The most common and stable oxidation state of a Lanthanoid is: **1**

A +2 **B** +3 **C** +4 **D** +6

Q87. Alkenes are formed by heating alcohols with conc. H_2SO_4. The first step in the reaction is: **1**

A formation of carbocation
B formation of ester
C protonation of alcohol molecule
D elimination of water

Q88. The pair $[Co(NH_3)_4Cl_2]Br_2$ and $[Co(NH_3)_4Br_2]Cl_2$ will show: **1**

A Linkage isomerism. **B** Hydrate isomerism. **C** Ionization isomerism. **D** Coordinate isomerism.

Q89. Which of the following is the slope of the first order reaction in the plot of In [R] vs. time? **1**

A + k
B $\frac{+k}{2.303}$
C - k
D $\frac{-k}{2.303}$

Q90. **Assertion (A):** $(CH_3)_3$ C–O–CH_3 gives $(CH_3)_3$ C–I and CH_3OH on treatment with HI. **1**
Reason (R): The reaction occurs by S_N1 mechanism.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is wrong statement.
D Assertion (A) is wrong, but Reason (R) is correct statement.

Q91. Coordination number of Fe in $[Fe(C_20_4)_3]^{3-}$ is: **1 Mark**

A 6 **B** 3 **C** 4 **D** 5

Q92. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1 Mark**
Assertion (A): Sucrose is a non-reducing sugar.
Reason (R): Reducing groups of glucose and fructose are involved in glycosidic bond formation.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

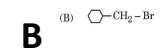
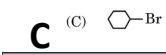
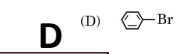
C Assertion (A) is correct, but Reason (R) is incorrect statement.

D Assertion (A) is incorrect, but Reason (R) is correct statement.

Q93. The gas evolved when methylamine reacts with HNO_2 is: **1 Mark**

A NO **B** N_2 **C** NH_3 **D** NO_2

Q94. The compound which undergoes S_N1 reaction most rapidly is: **1**

A (A) **B** (B)  **C** (C)  **D** (D) 

Q95. The reaction **1**

$$\text{R-OH} + \text{Na} \longrightarrow \text{RO}^-\text{Na}^+ + \frac{1}{2}\text{H}_2(\text{g})$$

suggests that alcohols are:

A Acidic **B** Basic **C** Neutral **D** Amphoteric

Q96. Out of Fe^{3+}, Sc^{3+}, Cr^{3+} and Co^{3+} ions, the one which is colourless in aqueous solution is: **1**

A Sc^{3+} **B** Fe^{3+} **C** Cr^{3+} **D** Co^{3+}

Q97. The complex ions $[Co(NH_3)_5 (NO_2)]^{2+}$ and $[Co(NH_3)_5(ONO)]^{2+}$ are called. **1**

A Ionization isomers **B** Linkage isomers **C** Co-ordination isomers **D** Geometrical isomers

Q98. For Questions two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1**

Assertion (A): When NaCl is added to water a depression in freezing point is observed.

Reason (R): NaCl undergoes dissociation in water.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q99. **Assertion (A):** F_2 is a strong oxidising agent. **1**

Reason (R): Electron gain enthalpy of fluorine is less negative.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q100. EDTA is a: **1**

A Monodentate ligand. **B** Bidentate ligand. **C** Ambidentate ligand. **D** Hexadentate ligand.

Q101. What will be formed after oxidation reaction of secondary alcohol with chromic anhydride (CrO_3)? **1**

A Aldehyde **B** Ketone **C** Carboxylic acid **D** Ester

Q102. What type of isomerism is shown by the pair $[Cr(H_2O)_6]Cl_3$ and $[Cr(H_2O)_5Cl]$ Cl2·H_2O? **1**

A Ionization isomerism. **B** Coordination isomerism. **C** Solvate isomerism. **D** Linkage isomerism.

Q103. **Assertion (A):** Elevation in boiling point is a colligative property. **1 Mark**

Reason (R): Elevation in boiling point is directly proportional to molarity.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q104. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1 Mark**

Assertion (A): The C–O–H bond angle in alcohols is slightly less than the tetrahedral angle.

Reason (R): This is due to the repulsive interaction between the two lone electron pairs on oxygen.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is incorrect statement.

D Assertion (A) is correct, but Reason (R) is incorrect statement.

Q105. Which reagents are required for one step conversion of chlorobenzene to toluene? **1**

A $NaNO_2$ + HCl

B CH_3Cl/ Anhydrous $AlCl_3$

C CH_3Cl/ Fe, Dark

D CH_3Cl, Na, Dry ether

Q106. Pyranose ring of glucose is formed due to the reaction between: **1**

A C_1 and C_3 **B** C_1 and C_5 **C** C_1 and C_4 **D** C_1 and C2

Q107. The half-life period for a zero order reaction is equal to: **1**

A $\frac{0.693}{k}$

B $\frac{2k}{[R]_0}$

C $\frac{2.303}{k}$

D $\frac{[R]_0}{2k}$

Q108. **Directions:** In question number 13 and 16, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion(A): Boiling point of $(CH_3)_3N$ is higher than that of $CH_3CH_2CH_2NH_2$.

Reason (R): Hydrogen bonding is much more extensive in $(C_2H_5)NH_2$ as compared to n-$C_4H_9NH_2$.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q109. 50mL of an aqueous solution of glucose $C_6H_{12}O_6$ (Molar mass: 180g/ mol) contains 6.02×10^{22} molecules. The concentration of the solution will be: **1**

A 0.1M **B** 0.2M **C** 1.0M **D** 2.0M

Q110. The element having $[Ar]3d^{10}4s^1$ electronic configuration is: **1**

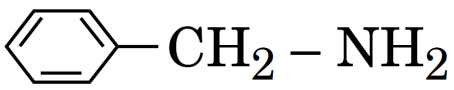
A Cu **B** Zn **C** Cr **D** Mn

Q111. Hoffmann Bromamide degradation reaction is given by: **1**

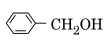
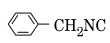
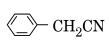
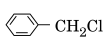
A $ArNO_2$ **B** $ArNH_2$ **C** $ArCONH_2$ **D** $ArCH_2NH_2$

Q112. In a chemical reaction X → Y, it is found that the rate of reaction doubles when the concentration of X is increased four times. The order of the reaction with respect to X is: **1**

A 1 **B** 0 **C** 2 **D** $\frac{1}{2}$

Q113.  **1**

on heating with $CHCl_3$ and alcoholic KOH gives foul smell of:

A  **B**  **C**  **D** 

Q114. For an electrolyte undergoing association in a solvent, the v factor: **1 Mark**

A is always greater than one

B has negative value

C has zero value

D is always less than one

Q115. Which of the following is affected by catalyst? **1 Mark**

A △H **B** △G **C** E_a **D** △S

Q116. Assertion (A) $[Cr(H_20)_6]CI_2$ and $[Fe(H_20)_6]CI_2$ are examples of homoleptic complexes. **1 Mark**

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Reason (R) All the ligands attached to the metal are the same.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q117. For Questions number 15 to 18, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion (A): -NH_2 group is o- and p-directing in electrophilic substitution reactions.
Reason (R): Aniline cannot undergo Friedel-Crafts reaction.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q118. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**

Assertion (A): Acetic acid is stronger than formic acid.
Reason (R): In acetic acid, the electron releasing methyl group makes it difficult to break the O – H bond.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is correct, but Reason (R) is incorrect statement.

Q119. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**

Assertion (A): Phenol is more acidic than p-methylphenol.
Reason (R): The presence of an electron releasing group in p-methylphenol makes it less acidic.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is correct, but Reason (R) is incorrect statement.

Q120. For the reaction X + 2Y → P, the differential form equation of the rate law is: **1**

A $\frac{2d[P]}{dt} = \frac{d[Y]}{dt}$
B $\frac{-d[P]}{dt} = \frac{-d[X]}{dt}$
C $\frac{+d[X]}{dt} = \frac{-d[P]}{dt}$
D $\frac{+2d[Y]}{dt} = \frac{+d[P]}{dt}$

Q121. **Assertion (A):** n - Butyl chloride has higher boiling point than n - Butyl bromide. **1**
Reason (R): C - Cl bond is more polar than C - Br bond.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q122. Which functional groups of glucose interact to form cyclic hemiacetal leading to pyranose structure? **1 Mark**

A Aldehyde group and hydroxyl group at C - 4
B Aldehyde group and hydroxyl group at C - 5
C Ketone group and hydroxyl group at C - 4
D Ketone group and hydroxyl group at C - 5

Q123. Which parts of amino acids molecules are linked through hydrogen bonds in the secondary structure of proteins? **1 Mark**

A NH_2 group.
B COOH group.

C $-\overset{\overset{\mathrm{O}}{\|}}{\mathrm{C}}-$ and $-\mathrm{NH}-$ groups.

D None of the above.

Q124. The reaction of an alkyl halide with sodium alkoxide forming ether is known as: **1 Mark**

A Wurtz reaction **B** Reimer-Tiemann reaction **C** Williamson synthesis **D** Kolbe reaction

Q125. Which one of the following amines gives an alcohol on reaction with HNO_2? **1 Mark**

A $(C_2H_5)_2NH$ **B** $(C_2H_5)_3N$ **C** $C_2H_5NH_2$ **D** $C_6H_5NH_2$

Q126. **Directions:** In question number 13 and 16, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion (A): Hydrolysis of an ester follows first order kinetics.

Reason (R): The concentration of water does not get altered much during the reaction.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q127. Which of the following compounds will give a ketone on oxidation with chromic anhydride (CrO_3)? **1**

A $(CH_3)_2CH-CH_2OH$

B $CH_3CH_2CH_2OH$

C $(CH_3)_3C-OH$

D $CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-OH_3$

Q128. **Assertion (A):** For complex reactions molecularity and order are not same. **1**

Reason (R): Order of reaction may be zero.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q129. The unit of rate constant depends upon the: **1**

A Molecularity of the reaction.

B Activation energy of the reaction.

C Order of the reaction.

D Temperature of the reaction.

Q130. Acetic acid reacts with PCl_5 to give: **1**

A Cl - CH_2 - COCl **B** Cl - CH_2 - COOH **C** CH_3 - COCl **D** CCl_3 - COOH

Q131. **Assertion (A):** F_2 has low reactivity. **1**

Reason (R): F-F bond has low Δ_{bond} H°.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q132. Which of the following will give a white precipitate upon reacting with AgNO3? **1 Mark**

A $K_2[Pt(en)_2Cl_2]$ **B** $[Co(NH_3)_3Cl_3]$ **C** $[Cr(H_2O)_6]Cl_3$ **D** $[Fe(H_2O)_3Cl_3]$

Q133. **Directions:** In question number 13 and 16, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1 Mark**

Assertion (A): Order of the reaction can be zero or fractional.

Reason (R): We cannot determine order from balanced chemical equation.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q134. $\alpha - \mathrm{D\text{-}glucose}$ and $\beta - \mathrm{D\text{-}glucose}$ differ from each other with respect to the: **1 Mark**

A size of the hemiacetal ring
B configuration at the C_2 carbon
C number of — OH groups
D configuration at the C_1 carbon

Q135. 'Which of the following molecules is chiral in nature? **1**

A 1-chloropropane **B** 2-chloropropane **C** 1-chlorobutane **D** 2-chlorobutane

Q136. A conductivity cell usually consists of two: **1**

A Copper electrodes **B** Platinum electrodes **C** Zinc electrodes **D** Iron electrodes

Q137. The role of a catalyst is to change: **1**

A equilibrium constant
B enthalpy of reaction
C Gibbs energy of reaction
D activation energy of reaction

Q138. For questions number 13 to 16, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below: **1**
Assertion (A): [Cr(H,0)4]Cl, and [Fe(H,0)¢]Cl, are examples of homoleptic complexes.
Reason (R): All the ligands attached to the metal are the same.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q139. Two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: **1**
Assertion (A): F - F bond in F_2 molecule is weak.
Reason (R): F atom is small in size.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is incorrect statement.
D Assertion (A) is incorrect, but Reason (R) is correct statement.

Q140. Williamson synthesis of preparing unsymmetrical ether is: **1**

A SN^1 reaction
B SN^2 reaction
C Electrophilic addition reaction
D Elimination reaction

Q141. 'We cannot measure the resistance of an ionic solution using DC because: **1**

A it changes the composition of the solution.
B it can cause sparks and shocks.
C it does not affect the composition of the solution.
D it converts electrolytic cell to galvanic cell.

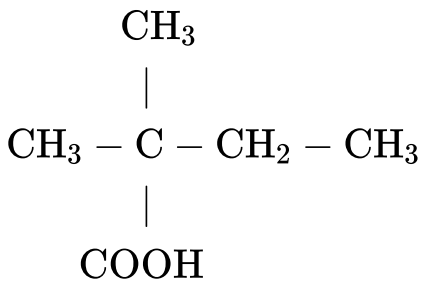
Q142. The formula of the complex triamminetri (nitrito-O) Cobalt (III) is: **1**

A $[Co(ONO)_3(NH_3)_3]$ **B** $[Co(NO_2)3(NH_3)_3]$ **C** $[Co(ONO_2)3(NH_3)_3]$ **D** $[Co(NO_2)(NH_3)_3]$

Q143. On mixing 30mL of acetone with 20mL of chloroform, the total volume of solution is: **1 Mark**

A equal to 10mL **B** less than 50mL **C** greater than 50mL **D** equal to 50mL

Q144. What is the correct IUPAC name of the given compound? **1 Mark**



A 2, 2-Dimethylbutanoic acid.
B 2-Carboxyl-2-methylbutane.
C 2-Ethyl-2-methylpropanoic acid.
D 3-Methylbutane carboxylic acid.

Q145. **Assertion (A):** Ortho and para-nitrophenols can be separated by steam distillation. **1 Mark**
Reason (R): Ortho isomer associates through intermolecular hydrogen bonding while Para isomer associates through intramolecular hydrogen bonding.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is correct, but Reason (R) is wrong statement.
D Assertion (A) is wrong, but Reason (R) is correct statement.

Q146. In the Arrhenius equation $k = Ae^{-E_a/RT}$, 'A' , represents : **1**

A effective collisions
B frequency factor
C fraction of collisions
D thres hold energy

Q147. For question number 13 to 16, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below: **1**
Assertion (A): Aromatic primary amines cannot be prepared by Gabriel Phthalimide synthesis.
Reason (R): Aryl halides do not undergo nucleophilic substitution reaction with the anion formed by phthalimide.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q148. The formation of cyanohydrin from an aldehyde is an example of: **1**

A nucleophilic addition
B electrophilic addition
C nucleophilic substitution
D electrophilic substitution

Q149. The value of rate constant for a pseudo first order reaction: **1**

A depends only on temperature.
B depends on the concentration of reactants present in small amount.
C depends on the concentration of reactants present in large excess.
D is not dependent on the concentration of reactants.

Q150. Which of the following does not show variable oxidation state? **1**

A Sc **B** Mn **C** Cr **D** Cu

Q151. For a zero order reaction, the slope in the plot of [R] Vs. time is: **1**

A $\frac{-k}{2.303}$
B $-k$
C $\frac{+k}{2.303}$
D $+k$

Q152. Scurvy is caused due to deficiency of: **1 Mark**

A Vitamin Bl
B Vitamin B2
C Ascorbic acid
D Glutamic acid

Q153. The charge required for the reduction of 1 mol of MnO_4 to MnO_2, is 1F. **1 Mark**

A 1F
B 3F
C 5F
D 6F

Q154. In an electrochemical process, a salt bridge is used: **1 Mark**

A As a reducing agent.
B As an oxidizing agent.

C To complete the circuit so that current can flow. **D** None of these.

Q155. The activation energy (E_a) of a reaction can be determined from the slope of which of the following plots? **1 Mark**

A $\ln k$ vs. T **B** $\frac{\ln k}{T}$ vs. T

C $\ln k$ vs. $\frac{1}{T}$ **D** $\frac{T}{\ln k}$ vs. $\frac{1}{T}$

Q156. Which of the following cell converts the energy of combustion of fuel into electrical energy? **1 Mark**

A Mercury cell **B** Fuel cell **C** Dry cell **D** Lead storage cell

Q157. Which of the following haloalkanes is most reactive towards Sy_2 reaction? **1**

A CH_3-CH_2- I **B** CH_3-CH_2- Br **C** CH_3-CH_2- Cl **D** CH_3-CH_2- F

Q158. The treatment of ethyl bromide with alcoholic silver nitrite gives: **1**

A ethyl nitrite **B** nitroethane **C** nitromethane **D** ethene

Q159. CH_3CH_2CHO and $CH_3CH,COOH$ can be distinguished by: **1**

A Sodium bicarbonate test **B** Hinsberg test **C** Iodoform test **D** Lucas test

Q160. **Assertion (A):** An ideal solution obeys Henry's law. **1**
Reason (R): In an ideal solution, solute-solute as well as solventsolvent interactions are similar to solute-solvent interaction.

A Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is correct, but Reason (R) is wrong statement.

D Assertion (A) is wrong, but Reason (R) is correct statement.

Q161. For Questions two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). **1**
Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.
Assertion (A): The pKa of ethanoic acid is lower than that of Cl - CH_2 - COOH.
Reason (R): Chlorine shows electron withdrawing (I) effect which increases the acidic character of Cl - CH_2 COOH.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Q162. The reagent that can be used to convert benzenediazonium chloride to benzonitrile is: **1**

A Cu/ HCl **B** CH_3CN **C** $C_2H_5NH_2$ **D** $C_6H_5NH_2$

Q163. During electrolysis of dilute H_2SO_4 using platinum electrodes, the gas evolved at the anode is: **1**

A H_2 gas **B** O_2 gas **C** SO_2 gas **D** SO_3 gas

Q164. Among the following outermost electronic configurations of transition metals, which one shows the highest oxidation state? **1**

A $3d^64s^2$ **B** $3d^54s^1$ **C** $3d^54s^2$ **D** $3d6^3s^2$

Q165. During dehydration of alcohol to alkene by heating with conc. H_2SO_4, the initiation step is: **1**

A Formation of an ester **B** Formation of carbocation
C Protonation of alcohol **D** Elimination of water

Q166. Iodoform test is given by: **1 Mark**

A Pentan-2-one. **B** Ethanoic acid. **C** Pentan-3-one. **D** Methoxymethane.

Q167. **Assertion (A):** Acetanilide is less basic than aniline. **1 Mark**
Reason (R): Acetylation of aniline results in decrease of electron density on nitrogen.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q168. For question number 13 to 16, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below: **1 Mark**
Assertion (A): Vitamin D cannot be stored in our body.
Reason (R): Vitamin D is fat soluble vitamin and is not excreted from the body in urine.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q169. Which of the following solutions of KCl will have the highest value of specific conductance? **1**

A 0.5M **B** 0.01M **C** 0.1M **D** 1.0M

Q170. The unit of the rate of reaction is the same as that of the rate constant for a: **1**

A First order reaction. **B** Zero order reaction. **C** Second order reaction. **D** Half-order reaction.

Q171. Peptide linkage is present in: **1**

A Carbohydrates. **B** Vitamins. **C** Proteins. **D** Rubber.

Q172. **Directions:** In question number 13 and 16, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**
Assertion (A): Actinoids show wide range of oxidation states.
Reason (R): Actinoids are radioactive in nature.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Q173. a-helix structure refers to: **1**

A primary structure of protein
B secondary structure of protein
C tertiary structure of protein
D quaternary structure of protein

Q174. Iodoform test is not given by: **1**

A Ethanol. **B** Ethanal. **C** Pentan-2-one. **D** Pentan-3-one.

Q175. In fuel cell: **1**

A Chemical energy is converted to electrical energy.
B Energy of combustion of fuel is converted to chemical energy.
C Energy of combustion of fuel is converted to electrical energy.
D Electrical energy is converted to chemical energy.

Q176. When alkyl iodide is treated with large excess of ammonia, the major product obtained is:

A Tertiary amine
B Quaternary ammonium salt
C Secondary amine
D Primary amine

Q177. Which of the following is the most stable complex? **1 Mark**

A $[Fe(CO)_5]$ **B** $[Fe(H_2O)_6]^{3+}$ **C** $[Fe(C_2O_4)_3]^{3-}$ **D** $[Fe(CN)_6]^{3-}$

Q178. Out of the following, the strongest base in aqueous solution is: **1 Mark**

A Methylamine. **B** Dimethylamine. **C** Trimethylamine. **D** Aniline.

Q179. According to Werner's theory of coordination compounds: **1 Mark**

A Primary valences are ionisable.
B Secondary valences are ionisable.

C Both primary and secondary valences are non-ionisable.

D Both primary and secondary valences are ionisable.

Q180. How many ions are produced from the complex $[Co(NH_3)_5Cl]Cl_2$ in solution? **1 Mark**

A 4 **B** 2 **C** 3 **D** 5