रासायनिक बलगतिकी
Chemical Kinetic

1. The rate of a chemical reaction depends upon
(A) Time (B) Pressure
(C) Concentration (D) All of these

2. The rate of disappearance of SO_2 in the reaction $2SO_2 + O_2 \rightarrow 2SO_3$ is $1.28 \times 10^{-3} g/sec$ then the rate of formation of SO_3 is
(A) $0.64 \times 10^{-3} g/sec$ (B) $0.80 \times 10^{-3} g/sec$
(C) $1.28 \times 10^{-3} g/sec$ (D) $1.60 \times 10^{-3} g/sec$

3. The rate of a chemical reaction
(A) Increases as the reaction proceeds
(B) Decreases as the reaction proceeds
(C) May increase or decrease during the reaction
(D) Remains constant as the reaction proceeds

4. The rate of a reaction
(A) Increases with increase in temperature
(B) Decreases with increase in temperature
(C) Does not depend on temperature
(D) Does not depend on concentration

5. The rate of a reaction that not involve gases is not dependent on
(A) Pressure (B) Temperature
(C) Concentration (D) Catalyst

6. The velocity of the chemical reaction doubles every 10^oC rise of temperature. If the temperature is raised by 50^oC, the velocity of the reaction increases to about
(A) 32 times (B) 16 times
(C) 20 times (D) 50 times

7. The rate of a gaseous reaction is given by the expression $K[A][B]$. If the volume of the reaction vessel is suddenly reduced to 1/4th of the initial volume, the reaction rate relating to original rate will be
(A) 1/10 (B) 1/8
(C) 8 (D) 16

8. A catalyst increases the rate of a chemical reaction by
(A) Increasing the activation energy
(B) Decreasing the activation energy
(C) Reacting with reactants
(D) Reacting with products

9. For a given reaction $3A + B \rightarrow C + D$ the rate of reaction can be represented by
(A) $-\frac{1}{3}\frac{d[A]}{dt} = \frac{-d[B]}{dt} = \frac{+d[C]}{dt} = \frac{+d[D]}{dt}$
(B) $-\frac{1}{3}\frac{d[A]}{dt} = \frac{d[C]}{dt} = K[A]^m[B]^n$
(C) $+\frac{1}{3}\frac{d[A]}{dt} = \frac{-d[C]}{dt} = K[A]^n[B]^m$
(D) None of these

10. An increase in temperature by 10^oC, generally increases the rate of a reaction by
(A) 2 times (B) 10 times
(C) 9 times (D) 100 times

11. For the reaction $N_2 + 3H_2 \rightarrow 2NH_3$ if $\frac{\Delta[NH_3]}{\Delta t} = 2 \times 10^{-4} mol\ l^{-1}s^{-1}$, the value of $\frac{-\Delta[H_2]}{\Delta t}$ would be
(A) $1 \times 10^{-4} mol\ l^{-1}s^{-1}$ (B) $3 \times 10^{-4} mol\ l^{-1}s^{-1}$
(C) $4 \times 10^{-4} mol\ l^{-1}s^{-1}$ (D) $6 \times 10^{-4} mol\ l^{-1}s^{-1}$

12. The rate law for reaction $A + 2B = C + 2D$ will be
(A) Rate $= K[A][B]$ (B) Rate $= K[A][2B]$
(C) Rate $= K[A][B]^2$ (D) Rate $= K\frac{[C][D]^2}{[A][B]^2}$

13. Half life period of a first order reaction is 138.6 minutes. The velocity constant of the reaction is
(A) $0.05\,min^{-1}$ (B) $0.00005\,min^{-1}$
(C) $0.005\,min^{-1}$ (D) $200\,min^{-1}$

14. $A + 2B \rightarrow C + D$. If $-\frac{d[A]}{dt} = 5 \times 10^{-4} mol\ l^{-1}s^{-1}$ 1, then $-\frac{d[B]}{dt}$ is
(A) $2.5 \times 10^{-4} mol\ l^{-1}s^{-1}$ (B) $5.0 \times 10^{-4} mol\ l^{-1}s^{-1}$
(C) $2.5 \times 10 - 3 mol\ l^{-1}s^{-1}$ (D) $1.0 \times 10^{-3} mol\ l^{-1}s^{-1}$

15. In a first order reaction the concentration of reactant decreases from $800 mol/dm^3$ to $50 mol/dm^3$ is 2×10^2 sec. The rate constant of reaction in sec^{-1} is
(A) 2×10^4 (B) 3.45×10^{-5}
(C) 1.386×10^{-2} (D) 2×10^{-4}

16. The experimental data for the reaction $2A + B_2 \rightarrow 2AB$ is

Exp.	$[A]_0$	$[B]_0$	Rate (mole s^{-1})
(1)	0.50	0.50	1.6×10^{-4}
(2)	0.50	1.00	3.2×10^{-4}
(3)	1.00	1.00	3.2×10^4

The rate equation for the above data is
(A) Rate $= k[B_2]$ (B) Rate $= k[B_2]^2$
(C) Rate $= k[A]^2[B]^2$ (D) Rate $= k[A]^2[B]$

17. For the reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$ rate of reaction and rate constant are 1.02×10^{-4} and $3.4 \times 10^{-5}\ \text{sec}^{-1}$ respectively. The concentration of N_2O_5 at that time will be
(A) 1.732 (B) 3
(C) 1.02×10^{-4} (D) 3.4×10^5

18. The hydrolysis of ethyl acetate is a reaction of
$CH_3COOEt + H_2O \xrightarrow{H^+} CH_3COOH + EtOH$
(A) First order (B) Second order
(C) Third order (D) Zero order

19. The unit of specific reaction rate constant for a first order (if the concentration expressed in molarity) would be
(A) $mole\ litre^{-1}s^{-1}$ (B) $mole\ litre^{-1}$
(C) $mole\ s^{-1}$ (D) s^{-1}

20. Decay constant of a reaction is $1.1\times10^{-9}/\sec$, then the half life of the reaction is

(A) 1.2×10^{8} (B) 6.3×10^{8}

(C) 3.3×10^{8} (D) 2.1×10^{8}

21. The inversion of cane sugar is represented by

$C_{12}H_{22}O_{11}+H_2O\rightarrow C_6H_{12}O_6+C_6H_{12}O_6$

It is a reaction of

(A) Second order

(B) Unimolecular

(C) Pseudo unimolecular

(D) None of the three

22. The half life period of a first order reaction

(A) $\frac{0.693}{t}$ (B) $\frac{0.693}{K}$

(C) $\frac{2.303}{t}$ (D) $\frac{0.303}{K_1}$

23. Which one of the following does not represent Arrhenius equation

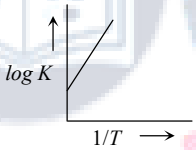
(A) $k=Ae^{-E/RT}$

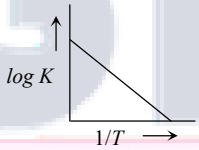
(B) $\log_e k=\log_e A-\frac{E}{RT}$

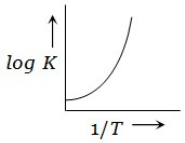
(C) $\log_{10} k=\log_{10} A-\frac{E}{2.303\,RT}$

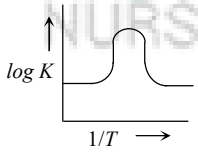
(D) $k=AE^{-RT}$

24. A graph plotted between log K vs $1/T$ for calculating activation energy is shown by

(A) 

(B) 

(C) 

(D) 

25. Relation between rate constant and temperature by Arrhenius equation is

(A) $\log_e A=\log_e K+\frac{E_a}{RT}$

(B) $\log K=A\frac{E_a}{RT}$

(C) $\log_e K=\log_e A-\frac{E_a}{RT^2}$

(D) $\log A=RT\ln E_a-\ln K$

26. Activation energy is given by the formula

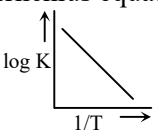
(A) $\log\frac{K_2}{K_1}=\frac{E_a}{2.303\,R}\left[\frac{T_2-T_1}{T_1T_2}\right]$

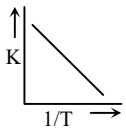
(B) $\log\frac{K_1}{K_2}=-\frac{E_a}{2.303\,R}\left[\frac{T_2-T_1}{T_1T_2}\right]$

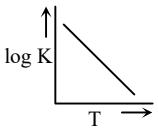
(C) $\log\frac{K_1}{K_2}=-\frac{E_a}{2.303\,R}\left[\frac{T_1-T_2}{T_1T_2}\right]$

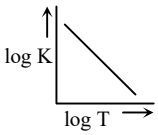
(D) None of these

27. Which of the following plots is in accordance with the Arrhenius equation

(A) 

(B) 

(C) 

(D) 

28. If we plot a graph between log K and $\frac{1}{T}$ by Arrhenius equation, the slope

(A) $-\frac{E_a}{R}$ (B) $+\frac{E_a}{R}$

(C) $-\frac{E_a}{2.303\,R}$ (D) $+\frac{E_a}{2.303\,R}$

29. For the reaction $H_2(g)+I_2(g)\rightleftharpoons 2HI(g)$, the rate of reaction is expressed as

(A) $-\frac{\Delta[I_2]}{\Delta t}=-\frac{\Delta[H_2]}{\Delta t}=\frac{1}{2}\frac{\Delta[HI]}{\Delta t}$

(B) $\frac{\Delta[I_2]}{\Delta t}=\frac{\Delta[H_2]}{\Delta t}=\frac{\Delta[HI]}{2\Delta t}$

(C) $\frac{\Delta[H_2]}{\Delta t}=\frac{1}{2}\frac{\Delta[I_2]}{\Delta t}=-\frac{\Delta[HI]}{\Delta t}$

(D) None of these

30. For an endothermic reaction, where ΔH represents the enthalpy of the reaction in kJ/mol, the minimum value for the energy of activation will be

(A) Less than ΔH (B) Zero

(C) More than ΔH (D) Equal to ΔH

CHEMISTRY

DPP-1

रासायनिक बलगतिकी
Chemical Kinetic

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	C	B	A	A	A	D	B	A	A	B	C	C	D	C
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	B	A	D	B	C	B	D	B	A	A	A	C	A	C

उपसहसंयोजन यौगिक
Co-ordiantion Compound

1. Which would exhibit co-ordination isomerism

(A) $[Cr(NH_3)_6][Co(CN)_6]$ (B) $[Co(en)_2Cl_2]$

(C) $[Cr(NH_3)_6]Cl_3$ (D) $[Cr(en)_2Cl_2]^+$

2. Paramagnetic co-ordination compounds contain ..... electrons

(A) No

(B) Both paired and unpaired

(C) Paired

(D) Unpaired

3. Which would exhibit ionisation isomerism

(A) $[Cr(NH_3)_6]Cl_3$ (B) $[Co(NH_3)_5Br]SO_4$

(C) $[Cr(en)_2Cl_2]$ (D) $[Cr(en)_3Cl_3]$

4. Magnetic moment of $[Cu(NH_3)_4]^{2+}$ ion is

(A) 1.414 (B) 1.73

(C) 2.23 (D) 2.38

5. Which of the following compounds exhibits linkage isomerism

(A) $[Co(en)_3]Cl_3$

(B) $[Co(NH_3)_6[Cr(CN)_6]$

(C) $[Co(en)_2NO_2Cl]Br$

(D) $[Co(NH_3)_5Cl]Br_2$

6. The number of unpaired electrons in $Ni(CO)_4$ is

(A) Zero (B) One

(C) Three (D) Five

7. The complexes $[Co(NH_3)_6][Cr(C_2O_4)_3]$ and $[Cr(NH_3)_6][Co(C_2O_4)_3]$

(A) Linkage isomerism

(B) Geometrical isomerism

(C) Coordination isomerism

(D) Ionisation isomerism

8. In the formation of $K_4Fe(CN)_6$, the hybridisation involved is

(A) sp^2 (B) d^2sp^3

(C) d^3sp^2 (D) d^4p

9. $[CoF_6]^{-3}$ is formed by ..... hybridization

(A) d^2sp^3 (B) d^3sp^2

(C) d^2sp^3 (D) sp^3d^2

10. Which one is an example of octahedral complex

(A) FeF_6^{3-} (B) $Zn(NH_3)_4^{2+}$

(C) $Ni(CN)_4^{2-}$ (D) $Cu(NH_3)_4^{2+}$

11. According to Lewis the ligands are

(A) Acidic in nature

(B) Basic in nature

(C) Neither acidic nor basic

(D) Some are acidic and others are basic

12. How many ions are produced in aqueous solution of $[Co(H_2O)_6]Cl_2$

(A) 2 (B) 3

(C) 4 (D) 6

13. The correct name of $[Pt(NH_3)_4Cl_2][PtCl_4]$ is

(A) Tetraammine dichloro platinum (iv) tetrachloro platinate (ii)

(B) Dichloro tetra ammine platinium (iv) tetrachloro platinate (ii)

(C) Tetrachloro platinum (ii) tetraammine platinate (iv)

(D) Tetrachloro platinum (ii) dichloro tetraammine platinate (iv)

14. The IUPAC name of $K_4[Fe(CN)_6]$ is

(A) Potassium hexacyanoferrate (II)

(B) Potassium ferrocyanide

(C) Tetrapotassium hexacyanoferrate (II)

(D) Tetrapotassium ferroushexacyanide (II)

15. Correct formula of diammine silver (I) chloride is

(A) $Ag(NH_3)Cl$ (B) $Ag(NH_2)Cl$

(C) $[Ag(NH_3)_2]Cl$ (D) $[Ag(NH_2)_2]Cl$

16. The IUPAC name of compound $Na_3[Co(ONO)_6]$ will be

(A) Hexanitritocobalt (III) sodium

(B) Sodium cobalt nitrite

(C) Sodium hexanitrocobaltate (III)

(D) Sodium hexanitritocobaltate (III)

17. The IUPAC name of $[Ni(CO)_4]$ is

(A) Tetra carbonyl nickel (II)

(B) Tetra carbonyl nickel (0)

(C) Tetra carbonyl nickelate (II)

(D) Tetra carbonyl nickelate (0)

18. Which of the following is an organometallic compound

(A) $Ti(C_2H_5)_4$ (B) $Ti(OC_2H_5)_4$

(C) $Ti(OCOCH_3)_4$ (D) $Ti(OC_6H_5)_4$

19. IUPAC name of $[Co(NH_3)_3(H_2O)_2Cl]\ Cl_2$ is

(A) Diaquachlorodiammine cobalt (III) chloride

(B) Triamminediaquachloro cobalt (III) chloride

(C) Chlorodiamminediaqua cobalt (III) chloride

(D) Diamminediaquachloro cobalt (II) chloride

20. $[Co(NH_3)_5NO_2]Cl_2$ and $[Co(NH_3)_5(ONO)]Cl_2$ are related to each other as

(A) Geometrical isomers

(B) Optical isomers

(C) Linkage isomers

(D) Coordination isomers

21. In $K_4Fe(CN)_6$

(A) (CN) are linked with primary valency

(B) (CN) are linked with secondary valency

(C) K are linked with secondary valency

(D) K are linked with non-ionic valency

22. The co-ordination number of cobalt in the complex $[Co(en)_2Br_2]Cl_2$ is

(A) 2 (B) 6

(C) 5 (D) 4

23. Which of the following acts as a bidentate ligand in complex formation

(A) Acetate (B) Oxalate

(C) Thiocyanate (D) EDTA

24. The formula of ferrocene is

(A) $[Fe(CN)_6]^{4-}$ (B) $[Fe(CN)_6]^{3-}$

(C) $[Fe(CO)_5]$ (D) $[(C_5H_5)_2Fe]$

25. Which is the example of hexadentate ligand

(A) 2, 2—dipyridyl

(B) Dimethyl glyoxime

(C) Aminodiacetate ion

(D) Ethylene diammine tetra acetate ion [EDTA]

26. Which of the following ligands forms a chelate

(A) Acetate (B) Oxalate

(C) Cyanide (D) Ammonia

27. Which of the following complexes show six coordination number

(A) $[Zn(CN)_4]^{2-}$ (B) $[Cr(H_2O)_6]^{3+}$

(C) $[Cu(CN)_4]^{2-}$ (D) $[Ni(NH_3)_4]^{2+}$

28. Given the molecular formula of the hexa coordinated complexes (A) $CoCl_3.6NH_3$ (B) $CoCl_3.5NH_3$ (C) $CoCl_3.4NH_3$. If the number of co-ordinated NH_3 molecules in *A*, *B* and *C* respectively are 6, 5 and 4, the primary valency in (A), (B) and (C) are:

(A) 6, 5, 4 (B) 3, 2, 1

(C) 0, 1, 2 (D) 3, 3, 3

29. Ligands, in complex compounds

(A) Accept e^- -pair

(B) Donate e^- -pair

(C) Neither accept e^- -pair nor donate

(D) All of these happen

30. Carnallite in solution in H_2O, shows the properties of

(A) K^+, Mg^{2+}, Cl^- (B) $K^+, Cl^-, SO_4^{2-}, Br^-$

(C) K^+, Mg^{2+}, CO_3^{2-} (D) K^+, Mg^{2+}, Cl^-, Br^-

CHEMISTRY

उपसहसंयोजन यौगिक
Co-ordiantion Compound

DPP-1

ANSWER KEY

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A	D	B	A	C	A	C	B	C	A	B	B	A	A	C
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	B	A	B	C	B	B	B	D	D	D	B	B	B	A

d एवं f – ब्लॉक के तत्व
d and f- Block Elements

1. Maximum number of oxidation states of transition metal is derived from the following configuration
(A) ns electron
(B) $(n-1)d$ electron
(C) $(n+1)d$ electron
(D) $ns+(n-1)d$ electron

2. The number of unpaired electrons in Cr^{+} will be
(A) 3 (B) 4
(C) 5 (D) 6

3. Zn is related to which group
(A) IIB (B) IIA
(C) IA (D) IB

4. If the colours of salts of transition elements are due to the presence of unpaired electrons in the transition metal ions, which of the following ions will be colourless in aqueous solution
(A) Ti^{3+} (B) Ti^{4+}
(C) Fe^{2+} (D) Fe^{3+}

5. The electronic configuration of cobalt is
(A) $1s^2,2s^2\,2p^6.3s^2\,3p^6\,3d^1,4s^2$
(B) $1s^2,2s^2\,2p^6,3s^2\,3p^6\,3d^7,4s^2$
(C) $1s^2,2s^2\,2p^6,3s^2\,3p^6\,3d^3,4s^2$
(D) $1s^2,2s^2\,2p^6,3s^2\,3p^6\,3d^5,4s^2$

6. Number of unpaired electrons in $Fe^{+++}(Z=26)$ is
(A) 4 (B) 5
(C) 6 (D) 3

7. Least reactive metal is
(A) Fe (B) Os
(C) Ni (D) Pt

8. In the following transition elements, the lowest M.P. and B.P. is exhibited by
(A) Cr (B) Hg
(C) Cu (D) Au

9. The valence shell electronic configuration of Cr^{2+} ion is
(A) $4s^o3d^4$ (B) $4s^23d^2$
(C) $4s^23d^0$ (D) $3p^64s^2$

10. Which forms interstitial compounds
(A) Fe (B) Co
(C) Ni (D) All of these

11. The number of unpaired electrons in ferrous ion is
(A) 5 (B) 4
(C) 3 (D) 2

12. Which of the following ions is paramagnetic
(A) Cu^{+} (B) Zn^{+2}
(C) Ti^{+3} (D) Ti^{+4}

13. Which of the following pair of ions may exhibit same colour
(A) Cr^{+++} and Fe^{++} (B) Ti^{+++} and V^{++}
(C) Fe^{+++} and Mn^{++} (D) Cu^{+} and Ni^{++}

14. Number of unpaired electrons in Mn^{2+} is
(A) 3 (B) 5
(C) 4 (D) 1

15. The highest oxidation state of Cr will be
(A) 2 (B) 3
(C) 4 (D) 6

16. Which statement is true about the transitional elements
(A) They are highly reactive
(B) They show variable oxidation states
(C) They have low M.P.
(D) They are highly electropositive

17. Transitional elements are
(A) All metals
(B) Few metals and few non-metals
(C) All solids
(D) All highly reactive

18. Which of the following statement is correct
(A) Iron belongs to 3rd transition series of the periodic table
(B) Iron belongs to *f*-block of the periodic table
(C) Iron belongs to second transition series of the periodic table
(D) Iron belongs to group VIII of the periodic table

19. Highest (+7) oxidation state is shown by
(A) Co (B) Cr
(C) V (D) Mn

20. Zinc does not show variable valency like *d*-block elements because
(A) It is a soft metal
(B) *d*-orbital is complete
(C) It is low melting
(D) Two electrons are present in the outermost orbit

21. Which of the following has highest ionic radii

(A) Cr^{+3} (B) Mn^{+3}

(C) Fe^{+3} (D) Co^{+3}

22. Variable valency is shown by

(A) Na (B) Cu

(C) Mg (D) Al

23. The coinage metals are

(A) Iron, Cobalt, Nickel

(B) Copper and Zinc

(C) Copper, Silver and Gold

(D) Gold and Platinum

24. Transitional elements are named transition elements because their characters are

(A) In between *s* and *p* - block elements

(B) Like that of *p* and *d* - block elements

(C) They are members of *I – A* group

(D) They are like inactive elements

25. Which ion has maximum magnetic moment

(A) V^{+3} (B) Mn^{+3}

(C) Fe^{+3} (D) Cu^{+2}

26. Which of the following has the maximum number of unpaired *d*-electrons

(A) Zn (B) Fe^{2+}

(C) Ni^{3+} (D) Cu^{+}

27. Which of the following transition metal cation has maximum unpaired electrons

(A) Mn^{+2} (B) Fe^{+2}

(C) Co^{2+} (D) Ni^{2+}

28. Which ion is not coloured

(A) Cr^{3+} (B) Co^{2+}

(C) Cr^{2+} (D) Cu^{+}

29. Which is not amphoteric

(A) Al^{3+} (B) Cr^{3+}

(C) Fe^{3+} (D) Zn^{2+}

30. Elements which generally exhibit multiple oxidation states and whose ions are usually coloured are

(A) Metalloids

(B) Transition elements

(C) Non-metals

(D) Gases

CHEMISTRY

d एवं f – ब्लॉक के तत्व
d and f - Block Elements

DPP-1

ANSWER KEY

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16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	A	D	D	B	A	B	C	A	C	B	A	D	C	B

विद्युत रसायन
Electrochemistry

1. Which of the following will not conduct electricity in aqueous solution
(A) Copper sulphate (B) Sugar
(C) Common salt (D) None of these

2. Electrolysis involves oxidation and reduction respectively at
(A) Anode and cathode
(B) Cathode and anode
(C) At both the electrodes
(D) None of the above

3. Electrolytes when dissolved in water dissociates into ions because
(A) They are unstable
(B) The water dissolves it
(C) The force of repulsion increases
(D) The forces of electrostatic

4. Amount of electricity that can deposit 108 *gm* of silver from $AgNO_3$ solution is
(A) 1 ampere (B) 1 coulomb
(C) 1 faraday (D) None of the above

5. According to the first law of Faraday, the weight of a substance discharge at the electrode is
(A) $W = ZQ$ (B) $W = eF$
(C) $W = \frac{Z}{F}It$ (D) $W = ZI$

6. When 9.65 coulombs of electricity is passed through a solution of silver nitrate (atomic weight of $Ag = 107.87$ taking as 108) the amount of silver deposited is
(A) 10.8 *mg* (B) 5.4 *mg*
(C) 16.2 *mg* (D) 21.2 *mg*

7. The desired amount of charge for obtaining one mole of Al from Al^{3+}
(A) $3 \times 96500\ C$ (B) $96500\ C$
(C) $\frac{96500}{3}C$ (D) $\frac{96500}{2}C$

8. In infinite dilutions, the equivalent conductances of Ba^{2+} and Cl^- are 127 and 76 $ohm^{-1}cm^{-1}\ eqvt^{-1}$. The equivalent conductivity of $BaCl_2$ at indefinite dilution is
(A) 101.5 (B) 139.5
(C) 203.5 (D) 279.5

9. Given $l/a = 0.5 cm^{-1}, R = 50 ohm, N = 1.0$. The equivalent conductance of the electrolytic cell is
(A) $10\ ohm^{-1}cm^2\ gm\ eq^{-1}$
(B) $20\ ohm^{-1}cm^2\ gm\ eq^{-1}$
(C) $300\ ohm^{-1}cm^2\ gmeq^{-1}$
(D) $100\ ohm^{-1}cm^2\ gmeq^{-1}$

10. Specific conductance of 0.1 *m* nitric acid is $6.3 \times 10^{-2}\ ohm^{-1}cm^{-1}$. The molar conductance of solution is
(A) $630\ ohm^{-1}cm^2mole^{-1}$
(B) $315\ ohm^{-1}cm^2mole^{-1}$
(C) $100\ ohm^{-1}cm^2mole^{-1}$
(D) $6300\ ohm^{-1}cm^2mole^{-1}$

11. If X is the specific resistance of the solution and M is the molarity of the solution, the molar conductivity of the solution is given by
(A) $\frac{1000X}{M}$ (B) $\frac{1000}{MX}$
(C) $\frac{1000M}{X}$ (D) $\frac{MX}{1000}$

12. The unit of equivalent conductivity is
(A) *ohm cm*
(B) $ohm^{-1}cm^2\ (gm\ \ equivalent)^{-1}$
(C) $ohm\ cm^2\ (gm\ \ equivalent)$
(D) $S\ cm^{-2}$

13. Conductivity (unit Siemen's) is directly proportional to area of the vessel and the concentration of the solution in it and is inversely proportional to the length of the vessel then the unit of the constant of proportionality is
(A) $Sm\ \ mol^{-1}$ (B) $Sm^2\ mol^{-1}$
(C) $S^{-2}m^2\ mol$ (D) $S^2m^2\ mol^{-2}$

14. In $Cu - Zn$ cell
(A) Reduction occurs at the copper cathode
(B) Oxidation occurs at the copper cathode
(C) Reduction occurs at the anode
(D) Chemical energy is converted to light energy

15. Consider the Galvanic cell $Zn^{\ominus}|\ ZnSO_4\ \|\ CuSO_4\ |\ Cu^{\oplus}$ the reaction at cathode is
(A) $Zn^{2+} + 2e^- \rightarrow Zn$
(B) $Cu^{2+} + 2e^- \rightarrow Cu$
(C) $Cu^{2+} + Zn \rightarrow Cu + Zn^{2+}$
(D) $Zn^{2+} + Cu \rightarrow Zn + Cu^{2+}$

16. $\lambda_{ClCH_2COONa} = 224\ ohm^{-1}cm^2gmeq^{-1}$,
$\lambda_{NaCl} = 38.2\ ohm^{-1}cm^2gmeq^{-1}$,
$\lambda_{HCl} = 203\ ohm^{-1}cm^2gmeq^{-1}$,
What is the value of λ_{ClCH_2COOH}
(A) $288.5\ ohm^{-1}cm^2gmeq^{-1}$
(B) $289.5\ ohm^{-1}cm^2gmeq^{-1}$
(C) $388.5\ ohm^{-1}cm^2gmeq^{-1}$
(D) $59.5\ ohm^{-1}cm^2gmeq^{-1}$

17. In electrolysis of dilute H_2SO_4 using platinum electrodes
(A) H_2 is evolved at cathode
(B) NH_3 is produced at anode
(C) Cl_2 is obtained at cathode
(D) O_2 is produced

18. For cell reaction, $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$, cell representation is

(A) $Zn \mid Zn^{2+} \| Cu^{2+} \mid Cu$

(B) $Cu \mid Cu^{2+} \| Zn^{2+} \mid Zn$

(C) $Cu \mid Zn^{2+} \| Zn \mid Cu^{2+}$

(D) $Cu^{2+} \mid Zn \| Zn^{2+} \mid Cu$

19. The specific conductance of a solution is 0.2 $ohm^{-1}cm^{-1}$ and conductivity is 0.04 ohm^{-1}. The cell constant would be

(A) 1 cm^{-1} (B) 0 cm^{-1}

(C) 5 cm^{-1} (D) 0.2 cm^{-1}

20. The unit of cell constant is

(A) $ohm^{-1}\,cm^{-1}$ (B) $ohm\,cm$

(C) cm (D) cm^{-1}

21. The standard cell potential of $Zn|\ Zn^{2+}(aq)\|\ Cu^{2+}(aq)|\ Cu$ cell is 1.10 V. The maximum work obtained by this cell will be

(A) 106.15 kJ (B) – 212.30 kJ

(C) – 318.45 kJ (D) – 424.60 kJ

22. The molar conductances of $NaCl, HCl$ and CH_3COONa at infinite dilution are 126.45, 426.16 and 91 $ohm^{-1}\,cm^2\,mol^{-1}$ respectively. The molar conductance of CH_3COOH at infinite dilution is

(A) 201.28 $ohm^{-1}\,cm^2\,mol^{-1}$

(B) 390.71 $ohm^{-1}cm^2\,mol^{-1}$

(C) 698.28 $ohm^{-1}\,cm^2\,mol^{-1}$

(D) 540.48 $ohm^{-1}cm^2\,mol^{-1}$

23. The relationship between standard reduction potential of cell and equilibrium constant is shown by

(A) $E^0_{cell} = \frac{n}{0.059}\log K_c$ (B) $E^0_{cell} = \frac{0.059}{n}\log K_c$

(C) $E^0_{cell} = 0.059\, n \log K_c$ (D) $E^0_{cell} = \frac{\log K_c}{n}$

24. The standard reduction potentials at 298 K for the following half reactions are given against each

$Zn^{2+}(aq.) + 2e \rightleftharpoons Zn(s)$; – 0.762

$Cr^{3+}(aq) + 3e \rightleftharpoons Cr(s)$; – 0.740

$2H^+(aq) + 2e \rightleftharpoons H_2(g)$; 0.00

$Fe^{3+}(aq) + e \rightleftharpoons Fe^{2+}(aq)$; 0.770

Which is the strongest reducing agent

(A) $Zn(s)$ (B) $Cr(s)$

(C) $H_2(g)$ (D) $Fe^{2+}(aq)$

25. The correct representation of Nernst's equation is

(A) $E_{M^{n+}/M} = E^o{}_{M^{n+}/M} + \frac{0.0591}{n}\log(M^{n+})$

(B) $E_{M^{n+}/M} = E^o{}_{M^{n+}/M} - \frac{0.0591}{n}\log(M^{n+})$

(C) $E_{M^{n+}/M} = E^o{}_{M^{n+}/M} + \frac{n}{0.0591}\log(M^{n+})$

(D) None of the above

26. Which of the following is correct expression for electrode potential of a cell

(A) $E = E^o - \frac{RT}{nF}\ln\frac{[\text{product}]}{[\text{reactant}]}$

(B) $E = E^o + \frac{RT}{F}\ln\frac{[\text{product}]}{[\text{reactant}]}$

(C) $E = E^o - \frac{RT}{nF}\ln\frac{[\text{reactant}]}{[\text{product}]}$

(D) $E = -\frac{RT}{F}\ln\frac{[\text{product}]}{[\text{reactant}]}$

27. Consider the reaction $M^{n+}_{(aq)} + ne^- \rightarrow M_{(s)}$. The standard reduction potential values of the elements M_1, M_2 and M_3 are $-0.34\,V, -3.05\,V$ and $-1.66\,V$ respectively. The order of their reducing power will be

(A) $M_1 > M_2 > M_3$ (B) $M_3 > M_2 > M_1$

(C) $M_1 > M_3 > M_2$ (D) $M_2 > M_3 > M_1$

28. Which one is not a conductor of electricity

(A) $NaCl$ (aqueous) (B) $NaCl$ (solid)

(C) $NaCl$ (molten) (D) Ag metal

29. The unit of molar conductivity is

(A) $\Omega^{-1}cm^{-2}mol^{-1}$ (B) $\Omega\, cm^{-2}mol^{-1}$

(C) $\Omega^{-1}cm^2mol^{-1}$ (D) $\Omega\, cm^2mol$

30. The factor which is not affecting the conductivity of any solution is

(A) Dilution

(B) Nature of electrolyte

(C) Temperature

(D) None of these

CHEMISTRY

विद्युत रसायन
Electrochemistry

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	A	D	C	A	A	A	B	A	D	B	B	B	A	B
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	A	A	C	D	B	B	B	A	A	A	D	B	C	D

हैलोऐल्केन एवं हैलोऐरीन
Haloalkane and Haloarine

1. In which one of the following conversions phosphorus pentachloride is used as a reagent

(A) $H_2C = CH_2 \rightarrow CH_3CH_2Cl$

(B) $H_3C - O - CH_3 \rightarrow CH_3Cl$

(C) $CH_3CH_2OH \rightarrow CH_3CH_2Cl$

(D) $HC \equiv CH \rightarrow CH_2 = CHCl$

2. Which of the following acids adds to propene in the presence of peroxide to give anti Markownikoff's product

(A) HF (B) HCl

(C) HBr (D) HI

3. Ullman's synthesis is carried out using

(A) Cu (B) Fe

(C) $AlCl_3$ (D) Fe_2O_3

4. How many structural isomers are possible for a compound with molecular formula C_3H_7Cl

(A) 2 (B) 5

(C) 7 (D) 9

5. Acetone reacts with I_2 in presence of $NaOH$ to form

(A) C_2H_5I (B) $C_2H_4I_2$

(C) CHI_3 (D) CH_3I

6. $CH_3CH_2\underset{\underset{Br}{|}}{C}HCH_3 \xrightarrow{NaNH_2}$ 1 – butene and 2- butene

Which are correct statements

(A) 1-butene is Hoffmann product

(B) 2-butene is saytzeff product

(C) Both are correct

(D) None of these

7. The fission of the bond in compound $A - B$ to give the intermediate $\overset{\oplus}{A}$: and $\overset{\oplus}{B}$ may be attributed to

(A) Homolytic bond fission

(B) Heterolytic bond fission

(C) Homolytic as well as heterolytic bond fission

(D) None of these

8. Haloforms are trihalogen derivatives of

(A) Ethane (B) Methane

(C) Propane (D) Benzene

9. The elimination of HX from an alkyl halide forms an alkene. The order of the elimination reactions is

(A) 3^o halide> 2^o halide> 1^o halide

(B) 1^o halide> 2^o halide> 3^o halide

(C) 1^o halide= 2^o halide> 3^o halide

(D) 2^o halide> 1^o halide> 3^o halide

10. Which of following is 2^o alkyl halide

(A) Isopropyl chloride (B) Isobutyl chloride

(C) *n*-propyl chloride (D) *n*-butyl chloride

11. In unimolecular nucleophilic substitution, alkyl halides react via the carbocation intermediate. The order of reactivity of the carbocations is

(A) $3^o > 2^o > 1^o$ (B) $1^o > 2^o > 3^o$

(C) $2^o > 1^o > 3^o$ (D) $3^o = 1^o > 2^o$

12. Full name of DDT is

(A) 1,1,1-trichloro-2,2-bis (*p*-chlorophenyl) ethane

(B) 1,1,-dichloro-2,2-diphenyl trimethylethane

(C) 1,1-dichloro-2,2-diphenyl trichloroethane

(D) None of these

13. Grignard reagent is prepared by the reaction between

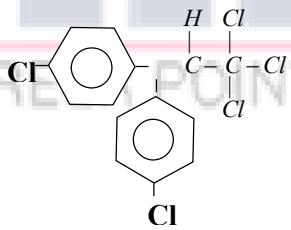
(A) Zinc and alkyl halide

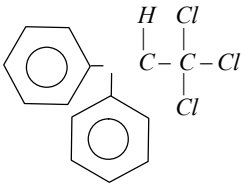
(B) Magnesium and alkyl halide

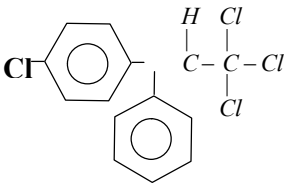
(C) Magnesium and alkane

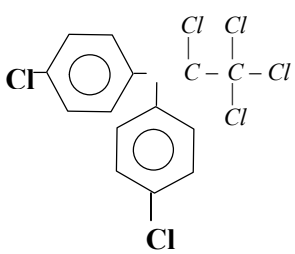
(D) Magnesium and aromatic hydrocarbon

14. Which one of the following is the correct formula of dichlorodiphenyl trichloroethane

(A) 

(B) 

(C) 

(D) 

15. In which alkyl halide, SN^2 mechanism is favoured maximum

(A) CH_3Cl (B) CH_3CH_2Cl

(C) $(CH_3)_2CHCl$ (D) $(CH_3)_3C-Cl$

16. Number of π-bonds present in B.H.C (Benzene hexachloride) are

(A) 6 (B) Zero

(C) 3 (D) 12

17. Chlorine reacts with ethanol to give

(A) Ethyl chloride (B) Chloroform

(C) Acetaldehyde (D) Chloral

18. Haloalkane in the presence of alcoholic *KOH* undergoes

(A) Elimination (B) Polymerisation

(C) Dimerisation (D) Substitution

19. Propene on treatment with *HBr* gives

(A) Isopropyl bromide (B) Propyl bromide

(C) 1,2 -dibromoethane (D) None of these

20. Ethanol is converted into ethyl chloride by reacting with

(A) Cl_2 (B) $SOCl_2$

(C) HCl (D) $NaCl$

21. Benzene hexachloride is prepared from benzene and chlorine in sunlight by

(A) Substitution reaction

(B) Elimination reaction

(C) Addition reaction

(D) Rearrangement reaction

22. Which reagent cannot be used to prepare an alkyl halide from an alcohol

(A) $HCl + ZnCl_2$ (B) $NaCl$

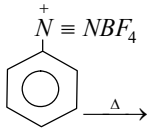
(C) PCl_5 (D) $SOCl_2$

23. $C_6H_6 + Cl_2 \xrightarrow{UV\ light}$

(A) CCl_3CHO (B) $C_6H_6Cl_6$

(C) $C_6H_{12}Cl_6$ (D) $C_6H_9Cl_2$

24.



(A) Fluorobenzene

(B) Benzene

(C) 1,4- difluorobenzene

(D) 1,3 – difluorobenzene

25. When ethyl alcohol (C_2H_5OH) reacts with thionyl chloride in the presence of pyridine, the product obtained is

(A) $CH_3CH_2Cl + HCl$

(B) $C_2H_5Cl + HCl + SO_2$

(C) $CH_3CH_2Cl + H_2O + SO_2$

(D) $CH_3CH_2Cl + Cl_2 + SO_2$

CHEMISTRY

हैलोऐल्केन एवं हैलोऐरीन
Haloalkane and Haloarine

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	C	A	A	C	C	B	B	A	A	A	A	B	A	A
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**					
B	D	A	A	B	C	B	B	A	B					

विलयन
Solution

1. A mixture of two completely miscible non-ideal liquids which distil as such without change in its compostion at a constant temperature as though it were a pure liquid. This mixture is known as
(A) Binary liquid mixture
(B) Azerotropic mixture
(C) Eutectic mixture
(D) Ideal mixture

2. The relative lowering of the vapour pressure is equal to the ratio between the number of
(A) Solute molecules to the solvent molecules
(B) Solute molecules to the total molecules in the solution
(C) Solvent molecules to the total molecules in the solution
(D) Solvent molecules to the total number of ions of the solute

3. Which is correct about Henry's law
(A) The gas in contact with the liquid should behave as an ideal gas
(B) There should not be any chemical interaction between the gas and liquid.
(C) The pressure applied should be high
(D) All of these

4. Solutions having the same osmotic pressure under a given set of conditions are known as
(A) Hypertonic (B) Hypotonic
(C) Normal (D) Isotonic

5. Sodium sulphate dissolves in water with evolution of heat. Consider a saturated solution of sodium sulphate. If the temperature is raised, then according to the *Le* Chatelier's principle
(A) More solid will dissolved
(B) Some solid will precipitate out from the solution
(C) The solution will become super-saturated
(D) Solution concentration will remain unchanged

6. Which statement is wrong regarding osmotic pressure (P), volume (V) and temperature (T)
(A) $P \propto \frac{1}{V}$, if T is constant
(B) $P \propto T$, if V is constant
(C) $P \propto V$, if T is constant
(D) PV is constant, if T is constant

7. Molarity of 4% $NaOH$ solution is
(A) $0.1\,M$ (B) $0.5\,M$
(C) $0.01\,M$ (D) $1.0\,M$

8. Which of the following is not correct for ideal solution
(A) $\Delta S_{mixing} = 0$
(B) $\Delta V_{mixing} = 0$
(C) $\Delta H_{mixing} = 0$
(D) It obeys Raoult's law

9. Molarity is expressed as
(A) Gram/litre (B) Litre/mole
(C) Moles/litre (D) Moles/1000 gm

10. Osmotic pressure of a solution can be measured quickly and accurately by
(A) Berkeley and Hartley's method
(B) Morse's method
(C) Preffer's method
(D) De Vries method

11. What will be the molarity of a solution containing $5\,g$ of sodium hydroxide in $250\,ml$ solution
(A) 0.5 (B) 1.0
(C) 2.0 (D) 0.1

12. The osmotic pressure of a dilute solution is given by
(A) $P = P_o x$ (B) $\pi V = nRT$
(C) $\Delta P = P_o N_2$ (D) $\frac{\Delta P}{P_o} = \frac{P_o - P}{P_o}$

13. A molal solution is one that contains one mole of a solute in
(A) 1000 gm of the solvent
(B) One litre of the solvent
(C) One litre of the solution
(D) 22.4 litres of the solution

14. Isotonic solution have the same
(A)Density (B) Molar concentration
(C) Normality (D) None of these

15. The normality of solution of $NaOH$;$100\,ml$ of which contains 4 g of $NaOH$ is
(A) 0.1 (B) 40
(C) 1.0 (D) 0.4

16. The osmotic pressure of a solution is given by the relation
(A) $\pi = RT / C$ (B) $\pi = CT / R$
(C) $\pi = RC / T$ (D) $\pi / C = ST$

17. How many moles of water are present in $180\,g$ of water
(A) 1 mole (B) 18 mole
(C) 10 mole (D) 100 mole

18. Isotonic solutions have
(A) Equal temperature
(B) Equal osmotic pressure
(C) Equal volume
(D) Equal amount of solute

19. The largest number of molecules is in
(A) $25\,g$ of CO_2 (B) $46\,g$ of C_2H_5OH
(C) $36\,g$ of H_2O (D) $54\,g$ of N_2O_5

20. Which of the following is not a colligative property
(A) Osmotic pressure
(B) Elevation in B.P.
(C) Vapour pressure
(D) Depression in freezing point

21. The molar solution of sulphuric acid is equal to
(A) N solution (B) $2N$ solution
(C) $N/2$ solution (D) $3N$ solution

22. The molecular mass of a solute in a solution can be calculated from the ebulliioscopic (elevation in B.P.) method using the expression
(A) $m = \frac{100 \times K_{1000} \times weight\ of\ solute}{\Delta T \times weight\ of\ solvent}$
(B) $m = \frac{1000 \times K_{1000} \times weight\ of\ solute}{\Delta T \times weight\ of\ solvent}$
(C) $m = \frac{1000 \times K_{1000} \times weight\ of\ solvent}{\Delta T \times weight\ of\ solvent}$
(D) $m = \frac{\Delta T \times weight\ of\ solvent}{1000 \times K_{1000} \times weight\ of\ solute}$

23. Normality of a 2 M sulphuric acid is
(A) $2\,N$ (B) $4\,N$
(C) $N/2$ (D) $N/4$

24. Which of the following will have the highest boiling point at $1\ atm$ pressure
(A) $0.1\,M\ NaCl$ (B) $0.1\,M$ sucrose
(C) $0.1\,M\ BaCl_2$ (D) $0.1\,M$ glucose

25. All form ideal solution except
(A) C_6H_6 and $C_6H_5CH_3$
(B) C_2H_5Br and C_2H_5I
(C) C_6H_5Cl and C_6H_5Br
(D) C_2H_5I and C_2H_5OH

26. **Assertion** (A) : An increase in surface area increases the rate of evaporation
Reason (R) : Stronger the inter-molecular attractive forces, fast is the rate of evaporation at a given temperature
(A) Both A and R are true and R is a correct explanation of A
(B) Both A and R are true but R is not a correct explanation of A
(C) A is true but R is false
(D) Both A and R are false

27. A liquid mixture boils without changing constituent is called
(A) Stable structure complex
(B) Binary liquid mixture
(C) Zeotropic liquid mixture
(D) Azeotropic liquid mixt

28. In mixture A and B components show negative deviation as
(A) $\Delta V_{mix} > 0$
(B) $\Delta H_{mix} < 0$
(C) A-B interactions is weaker than A-A and B-B interaction
(D) A-B interactions is strong than A- A and B - B interaction

29. An ideal solution is formed when its components
(A) Have no volume change on mixing
(B) Have no enthalpy change on mixing
(C) Have both the above characteristics
(D) Have high solubility

30. For a dilute solutions Raoult's law states that
(A) The lowering of vapour pressure is equal to the mole fraction of the solute
(B) The relative lowering of vapour pressure is equal to the mole fraction of the solute
(C) The relative lowering of vapour pressure is proportional to the amount of solute in solution
(D) The vapour pressure of the solution is equal to the mole fraction of the solvent

CHEMISTRY

विलयन
Solution

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	B	B	D	B	C	D	A	C	A	A	B	A	B	C
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	C	B	C	C	C	B	B	C	D	C	D	B	C	B

ऐल्कोहॉल, फिनॉल एवं ईथर
Alcohol, Phenol & Ether

1. Butane-2-ol is
(A) Primary alcohol
(B) Secondary alcohol
(C) Tertiary alcohol
(D) Aldehyde

2. In ethers, the $C-O-C$ bond angle is
(A) 180^o (B) 90^o
(C) 110^o (D) 160^o

3. Glycerol is a
(A) Primary alcohol
(B) Monohydric alcohol
(C) Secondary alcohol
(D) Trihydric alcohol

4. An example of a compound with the functional group '$-O-$' is
(A) Acetic acid (B) Methyl alcohol
(C) Diethyl ether (D) Acetone

5. Ortho-dihydroxy benzene is
(A) Carvacrol (B) Resorcinol
(C) Catechol (D) Orcinol

6. Absolute alcohol is
(A) 100% pure ethanol
(B) 95% alcohol + 5% H_2O
(C) Ethanol + water + phenol
(D) 95% ethanol + 5% methanol

7. Which of the following is tertiary alcohol
(A) $\begin{matrix} CH_2-OH \\ | \\ CH-OH \\ | \\ CH_2-OH \end{matrix}$ (B) $\begin{matrix} & & CH_2 & \\ & & | & \\ CH_3-&CH_2-&CH_2OH \\ & & | & \\ & & CH_2 & \\ & & | & \\ & & CH_3 & \end{matrix}$
(C) $\begin{matrix} & CH_3 & \\ & | & \\ CH_3-&C-&OH \\ & | & \\ & CH_3 & \end{matrix}$ (D) CH_3-CH_2-OH

8. Lucas test is used to distinguish between
(A) $1^o, 2^o$ and 3^o alcohols
(B) 1^o, 2^o and 3^o amines
(C) Aldehydes and ketones
(D) Alkenes and alkynes

9. Propene, $CH_3-CH=CH_2$ can be converted to 1-propanol by oxidation. Which set of reagents among the following is ideal to effect the conversion
(A) Alkaline $KMnO_4$
(B) B_2H_6 and alkaline H_2O_2
(C) O_3/Zn dust
(D) $OsO_4/CH_4, Cl_2$

10. $C_6H_5-CH=CHCHO \xrightarrow{X} C_6H_5CH=CHCH_2OH$.
In the above sequence X can be
(A) H_2/Ni
(B) $NaBH_4$
(C) $K_2Cr_2O_7/H^+$
(D) Both (A) and (B)

11. Which one of the following will produce a primary alcohol by reacting with CH_3MgI
(A) Acetone (B) Methyl cyanide
(C) Formeldyhyde (D) Ethyl acetate

12. The reaction given below is known as
$C_2H_5ONa + IC_2H_5 \longrightarrow C_2H_5OC_2H_5 + NaI$
(A) Kolbe's synthesis
(B) Wurtz's synthesis
(C) Williamson's synthesis
(D) Grignard's synthesis

13. $LiAlH_4$ converts acetic acid into
(A) Acetaldehyde (B) Methane
(C) Ethyl alcohol (D) Methyl alcohol

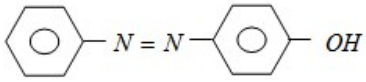
14. Which enzyme converts glucose and fructose both into ethanol
(A) Diastase (B) Invertase
(C) Zymase (D) Maltase

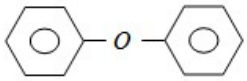
15. Chlorination of toluene in the presence of light and heat followed by treatment with aqueous $NaOH$ gives
(A) *o*-cresol
(B) *p*-cresol
(C) 2, 4-dihydroxy toluene
(D) Benzyl alcohol

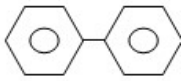
16. Benzenediazonium chloride on reaction with phenol in weakly basic medium gives
(A) Diphenyl ether
(B) *p*-hydroxyazobenzene
(C) Chlorobenzene
(D) Benzene

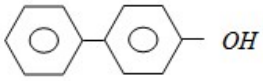
17. The alcohol that produces turbidity immediately with $ZnCl_2$ + conc. HCl at room temperature
(A) 1-hydroxybutane
(B) 2-hydroxybutane
(C) 2-hydroxy-2-methylpropane
(D) 1-hydroxy-2-methylpropane

18. 

(A) 

(B) 

(C) 

(D) 

19. The compound '*A*' when treated with ceric ammonium nitrate solution gives yellow *ppt*. The compound '*A*' is

(A) Alcohol (B) Aldehyde
(C) Acid (D) Alkane

20. Phenol is less acidic than

(A) Ethanol (B) Methanol
(C) *o*-nitrophenol (D) *p*-methylphenol

21. Which of the following compound give yellow precipitate with I_2 and *NaOH*

(A) CH_3OH (B) $CH_3CH_2CH_2OH$
(C) $C_2H_5OC_2H_5$ (D) CH_3CH_2OH

22. The increasing order of acidity among phenol, *p*-methylphenol, *m*-nitrophenol and *p*-nitrophenol is

(A) *m*-nitrophenol, *p*-nitrophenol, phenol, *p*-methylphenol
(B) *p*-methylphenol, *m*-nitrophenol, phenol, *p*-nitrophenol
(C) *p*-methylphenol, phenol, *m*-nitrophenol, *p*-nitrophenol
(D) Phenol, *p*-methylphenol, *p*-nitrophenol, *m*-nitrophenol

23. Which of the following reagents will produce salicyldehyde on reaction with phenol

(A) $CHCl_3$ / *NaOH* (B) CCl_4 / *NaOH*
(C) CH_2Cl_2 / *NaOH* (D) CH_3Cl / *NaOH*

24. The *–OH* group of methyl alcohol cannot be replaced by chlorine by the action of

(A) Chlorine
(B) Hydrogen chloride
(C) Phosphorus trichloride
(D) Phosphorus pentachloride

25. Lucas test is used for

(A) Alcohols
(B) Amines
(C) Diethyl ether
(D) Glacial acetic acid

26. In esterification, the reactivity of alcohols is

(A) $1° > 2° > 3°$ (B) $3° > 2° > 1°$
(C) Same in all cases (D) None of these

27. Maximum solubility of alcohol in water is due to

(A) Covalent bond (B) Ionic bond
(C) *H*-bond with H_2O (D) None of the above

28. Electrophilic substitution reaction in phenol take place at

(A) *p*- position (B) *m*- position
(C) *o*- position (D) *o*- and *p*- position

29. Conc. H_2SO_4 heated with excess of C_2H_5OH at 140^oC to form

(A) $CH_3CH_2-O-CH_3$
(B) $CH_3CH_2-O-CH_2CH_3$
(C) $CH_3-O-CH_2-CH_2-CH_3$
(D) $CH_2=CH_2$

30. Alcohol which gives red colour with Victor Meyer test is

(A) C_2H_5OH (B) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3$
(C) $C(CH_3)_3OH$ (D) None of these

CHEMISTRY

ऐल्कोहॉल, फिनॉल एवं ईथर
Alcohol, Phenol & Ether

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	C	D	C	C	A	C	A	B	B	C	C	C	C	D
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	C	A	A	C	D		A	A	A	A	C	D	B	A

ऐल्डिहाईड कीटोन एवं कार्बोक्सिलिक अम्ल
Aldehyde, Ketone and Carboxylic acid

1. Acetone and acetaldehyde are
(A) Position isomers
(B) Functional isomers
(C) Not isomers
(D) Chain isomers

2. When acetaldehyde is heated with Fehling solution, it gives a red precipitate of
(A) Cu (B) CuO
(C) Cu_2O (D) $Cu(OH)_2$

3. In aldehydes and ketones, carbon of carbonyl group is
(A) sp^3 hybridised (B) sp^2 hybridized
(C) sphybridised (D) Unhybridised

4. Which one of the following pairs is not correctly matched
(A) $> C = O \xrightarrow{\text{Clemenson' s reduction}} > CH_2$
(B) $> C = O \xrightarrow{\text{Wolf-Kishner reduction}} > CHOH$
(C) $-COCl \xrightarrow{\text{Rosenmund' s reduction}} CHO$
(D) $-C \equiv N \xrightarrow{\text{Stephen reduction}} CHO$

5. The general formula of both aldehydes and ketones is
(A) $C_nH_{2n+2}O$ (B) $C_nH_{2n}O$
(C) $C_nH_{2n-2}O$ (D) $C_nH_{2n+4}O$

6. Dry heating of calcium acetate gives
(A) Acetaldehyde (B) Ethane
(C) Acetic acid (D) Acetone

7. Rosenmund's reduction of an acyl chloride gives
(A) An aldehyde (B) An alcohol
(C) An ester (D) A hydrocarbon

8. Iodoform test is not given by
(A) Acetone (B) Ethyl alcohol
(C) Acetic acid (D) None of these

9. Compound which gives acetone on ozonolysis
(A) $CH_3 - CH = CH - CH_3$
(B) $(CH_3)_2C = C(CH_3)_2$
(C) $C_6H_5CH = CH_2$
(D) $CH_3CH = CH_2$

10. The active ion in Tollen's reagent is
(A) Cu^+ (B) $Cu(NH_3)_2^+$
(C) Ag^+ (D) $Ag(NH_3)_2^+$

11. Which of the following reactions give benzophenone
(A) $2C_6H_6 + CCl_4 \xrightarrow[(ii)H_2O]{(i)AlCl_3}$
(B) $C_6H_6 + C_6H_5COCl \xrightarrow{AlCl_3}$
(C) $o - CH_3C_6H_4COC_6H_5 \xrightarrow{\text{Heat}}$
(D) $o - HOOC - C_6H_4 - COC_6H_5 \xrightarrow[260^oC]{Cu}$

12. $C_6H_6 + CO + HCl \xrightarrow{\text{Anhy. } AlCl_3} X + HCl$. Compound X is
(A) $C_6H_5CH_3$ (B) $C_6H_5CH_2Cl$
(C) C_6H_5CHO (D) C_6H_5COOH

13. Cannizzaro reaction is not shown by
(A) $HCHO$ (B) C_6H_5CHO
(C) CH_3CHO (D) All of these

14. Toluene on treatment with CrO_2Cl_2 gives
(A) Chlorotoluene (B) Benzyl chloride
(C) Benzaldehyde (D) Benzoic acid

15. The product (B) is $CaC_2 \xrightarrow{H_2O}(A)\xrightarrow[HgSO_4]{\text{Dil. } H_2SO_4}(B)$
(A) CH_3OH (B) C_2H_5OH
(C) C_2H_4 (D) CH_3CHO

16. Schiff's reagent gives pink colour with
(A) Aldehydes (B) Ethers
(C) Ketones (D) Carboxylic acid

17. $(HCOO)_2Ca \xrightarrow{\text{dry distillation}} X + Y$ compounds X and Y are
(A) Formaldehyde and water
(B) Acetaldehyde and water
(C) Formaldehyde and calcium carbonate
(D) Acetaldehyde and calcium carbonate

18. Which of the following reagents distinguishes between aldehyde and ketone
(A) Fehling solution
(B) H_2SO_4 solution
(C) $NaHSO_3$
(D) NH_3

19. The reactivities of the carbonyl compounds formaldehyde (I), acetaldehyde (II) and acetone (III) towards nucleophiles decrease in the order
(A) I > II > III (B) III > II > I
(C) II > I > III (D) III > I > II

20. Out of butane, butanol-1, butanal and butanone, the decreasing order of their boiling point is

(A) Butane > butanol > butanal > butanone

(B) Butanol > butane > butanal > butanone

(C) Butanone > butanal > butanol > butane

(D) Butanol > Butanal > Butanone > butane

21. Tollen's reagent is

(A) Ammonical cuprous chloride

(B) Ammonical cuprous oxide

(C) Ammonical silver bromide

(D) Ammonical silver nitrate

22. Formaldehyde reacts with ammonia to give urotropine. The formula of urotropine is

(A) $(CH_2)_6N_4$ (B) $(CH_2)_4N_3$

(C) $(CH_2)_6N_6$ (D) $(CH_2)_3N_3$

23. The general formula $(RCO)_2O$ represents

(A) An ester

(B) A ketone

(C) An ether

(D) An acid anhydride

24. What happens when 2-hydroxy benzoic acid is distilled with zinc dust ? It gives

(A) Phenol

(B) Benzoic acid

(C) Benzaldehyde

(D) A polymeric compound

25. The acid which reduces Fehling solution is

(A) Methanoic acid (B) Ethanoic acid

(C) Butanoic acid (D) Propanoic acid

26. Acetic acid dissolved in benzene shows a molecular mass of

(A) 30 (B) 60

(C) 120 (D) 240

27. Alkaline hydrolysis of CH_3CN forms

(A) CH_3COOH (B) CH_3COO^-

(C) $HCOO^-$ (D) $HCOOH$

28. Which of the following is the correct order of increasing strengths of carboxylic acids

(A) $CH_2FCOOH < CH_3COOH < CH_2ClCOOH < CCl_3COOH$

(B) $CH_3COOH < CH_2ClCOOH < CH_2FCOOH < CCl_3COOH$`

(C) $CH_2ClCOOH < CH_2FCOOH < CCl_3COOH < CH_3COOH$

(D) $CCl_3COOH < CH_2ClCOOH < CH_2FCOOH < CH_3COOH$

29. Identify the correct order of boiling points of the following compounds

$\underset{(1)}{CH_3CH_2CH_2CH_2OH}$, $\underset{(2)}{CH_3CH_2CH_2CHO}$,

$\underset{(3)}{CH_3CH_2CH_2COOH}$

(A) 1>2>3 (B) 3>1>2

(C) 1>3>2 (D) 3>2>1

30. Treatment of benzoic acid with $Cl_2/FeCl_3$ will give

(A) *p*-chlorobenzoic acid

(B) *o*-chlorobenzoic acid

(C) 2,4-dichlorobenzoic acid

(D) *m*-chlorobenzoic acid

CHEMISTRY

ऐल्डिहाईड कीटोन एवं कार्बोक्सिलिक अम्ल
Aldehyde, Ketone and Carboxylic acid

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	C	B	B	B	D	A	C	B	D	B	C	C	C	D
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	C	A	A	D	D	A	D	B	A	C	B	B	B	D

ऐमीन
Amines

1. A secondary amine is

(A) An organic compound with two $-NH_2$ groups

(B) A compound with two carbon atoms and an $-NH_2$ groups

(C) A compound with an $-NH_2$ group on the carbon atom in number 2 position

(D) A compound in which two of the hydrogens of NH_3 have been replaced by organic groups

2. How many isomeric amines can have the formula $C_4H_{11}N$

(A) Five (B) Six

(C) Seven (D) Eight

3. In amines, the hybridisation state of *N* is

(A) sp (B) sp^2

(C) sp^3 (D) sp^2d

4. 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 takes place

5. C_3H_9N represents

(A) Primary amine (B) Secondary amine

(C) Tertiary amine (D) All of these

6. $CH_3CONH_2 \xrightarrow{Na+ROH} Z + H_2O$. What is *Z*

(A) $CH_3CH_2NH_2$ (B) CH_3CH_2NC

(C) $CH_3CH_2CH_3$ (D) NH_2CONH_2

7. Nitrobenzene combines with hydrogen in the presence of platinum to produce

(A) Toluene (B) Benzene

(C) Aniline (D) Azobenzene

8. Hofmann's hypobromite reaction affords a method of

(A) Preparing a tertiary amine

(B) Preparing a mixture of amines

(C) Stepping down a series

(D) Stepping up a series

9. $CH_3NO_2 \xrightarrow{Sn+HCl} CH_3X$, the '*X*' contain

(A) $-NH_2$ (B) $-COOH$

(C) $-CHO$ (D) $(CH_3CO)_2O$

10. Which one of the following will give a primary amine on hydrolysis

(A) Nitroparaffin (B) Alkyl cyanide

(C) Oxime (D) Alkyl isocyanide

11. Indicate which nitrogen compound amongst the following would undergo Hofmann's reaction (*i.e.* reaction with Br_2 and strong *KOH*) to furnish the primary amine $(R-NH_2)$

(A) $R-\overset{O}{\overset{\|}{C}}-NH.CH_3$ (B) $R-\overset{O}{\overset{\|}{C}}-O.NH_4$

(C) $R-\overset{O}{\overset{\|}{C}}-NH_2$ (D) $R-\overset{O}{\overset{\|}{C}}-NHOH$

12. Ethyl isocyanide is prepared by the reaction between

(A) C_2H_5Br and *KCN*

(B) C_2H_5Br and *AgCN*

(C) C_2H_5Br and *HCN*

(D) C_2H_5Br and NH_3

13. Identify '*B*' in the reaction,

$$\text{Acetamide} \xrightarrow[\Delta]{P_2O_5} A \xrightarrow{4H} B$$

(A) CH_3NH_2 (B) $CH_3CH_2NH_2$

(C) CH_3CN (D) CH_3COONH_4

14. In the reaction $CH_3CONH_2 \xrightarrow{Br_2+KOH} CH_3NH_2$ the intermediates involved are

(A) $CH_3CONHBr$ (B) CH_3NHBr

(C) $CH_3N=C=O$ (D) CH_3CONBr_2

15. Which of the following reactions will produce methyl nitrite as the major product

(A) $CH_3I + AgNO_2 \rightarrow$ (B) $CH_3I + NaNO_2 \rightarrow$

(C) Both (A) and (B) (D) None of these

16. The conversion $CH_3CN \rightarrow CH_3CH_2NH_2$ can be effected by using

(A) Pt/H_2 (B) $LIAlH_4$

(C) Na/C_2H_5OH (D) $SnCl_2/HCl$

17. Which of the following reactions will not give primary amine

(A) $CH_3CONH_2 \xrightarrow{KOH.Br_2}$

(B) $CH_3CN \xrightarrow{LiAlH_4}$

(C) $CH_3NC \xrightarrow{LiAlH_4}$

(D) $CH_3CONH_2 \xrightarrow{LiAlH_4}$

18. Nitrobenzene on nitration gives

(A) *o*-dinitrobenzene

(B) *p*-dinitrobenzene

(C) *m*-dinitrobenzene

(D) *o*- and *p*-nitrobenzene

19. The product of mustard oil reaction is

(A) Alkyl isothiocyanate

(B) Dithio carbonamide

(C) Dithioethylacetate

(D) Thioether

20. In the reaction $CH_3CN + CH_3MgI \rightarrow A \xrightarrow{H_2O/H^-} B$. The compound B is

(A) Acetic acid (B) Acetone

(C) Acetaldehyde (D) Ethyl alcohol

21. The reaction

$C_6H_5NH_2 + CHCl_3 + 3KOH \rightarrow C_6H_5NC + 3KCl + 2H_2O$ is known as

(A) Carbylamine reaction

(B) Reimer-Tiemann reaction

(C) Kolbe reaction

(D) Hofmann's degradation

22. Identify the product Z in the series $CH_3CN \xrightarrow{Na+C_2H_5OH} X \xrightarrow{HNO_2} Y \xrightarrow[H_2SO_4]{K_2Cr_2O_7} Z$

(A) CH_3CHO (B) CH_3CONH_2

(C) CH_3COOH (D) CH_3CH_2NHOH

23. Nitrobenzene on reduction by zinc and NH_4Cl gives

(A) Aniline

(B) Nitrosobenzene

(C) Hydrazobenzene

(D) Phenylhydroxyl amine

24. $RCOOH \xrightarrow[\text{reduction } R']{N_3H,\Delta}$ product P. Product P and reaction R' are

(A) RNH_2, Schmidt

(B) $RCONH_2$, Schmidt

(C) $RCONH_2$, Hofmann

(D) NRH_2, Hofmann

25. Amines behave as

(A) Lewis acids

(B) Lewis bases

(C) Aprotic acids

(D) Amphoteric compounds

26. The end product of the reactions is $C_2H_5NH_2 \xrightarrow{HNO_2} A \xrightarrow{PCl_5} B \xrightarrow{H.NH_2} C$

(A) Ethyl cyanide (B) Ethyl amine

(C) Methyl amine (D) Acetamide

27. Primary and secondary amines are distinguished by

(A) Br_2/KOH (B) $HClO_4$

(C) HNO_2 (D) NH_3

28. Decreasing order of basicity is

(1) CH_3CONH_2 (2) $CH_3CH_2NH_2$

(3) $Ph-CH_2CONH_2$

(A) 1 > 2 > 3 (B) 2 > 1 > 3

(C) 3 > 2 > 1 (D) None of these

29. The decreasing order of the basic character of the three amines and ammonia is

(A) $NH_3 > CH_3NH_2 > C_2H_5NH_2 > C_6H_5NH_2$

(B) $C_2H_5NH_2 > CH_3NH_2 > NH_3 > C_6H_5NH_2$

(C) $C_6H_5NH_2 > C_2H_5NH_2 > CH_3NH_2 > NH_3$

(D) $CH_3NH_2 > C_2H_5NH_2 > C_6H_5NH_2 > NH_3$

30. **Assertion** (A): Amines are basic in nature.

Reason(*R*) : There is the presence of lone pair of electron on nitrogen.

(A) Both *A* and *R* are true and *R* is a correct explanation of *A*

(B) Both *A* and *R* are true but *R* is not a correct explanation of *A*

(C) *A* is true but *R* is false

(D) Both *A* and *R* are false

CHEMISTRY

ऐमीन
Amines

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	A	C	B	D	A	C	C	A	D	C	B	B	A	B
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A,B,C	C	C	A	B	A	C	D	A	B	B	C	B	B	A

Basic Chemistry

1. The number of unpaired electrons in ferrous ion is

(A) 5 (B) 4

(C) 3 (D) 2

2. The number of unpaired electrons in Cr^{+} will be

(A) 3 (B) 4

(C) 5 (D) 6

3. The electronic configuration (outermost) of Mn^{+2} ion (atomic no. of $Mn = 25$) in its ground state is

(A) $3d^5 4s^0$ (B) $3d^4 4s^1$

(C) $3d^3 4s^2$ (D) $3d^2 4s^2 4p^2$

4. Highest (+7) oxidation state is shown by

(A) Co (B) Cr

(C) V (D) Mn

5. The element having electronic configuration belongs to $ns^2(n-1)d^{1-10}(n-2)f^{1-14}$

(A) *s*-block (B) *p*-block

(C) *d*-block (D) *f*-block

6. The first transition element is

(A) Chromium (B) Scandium

(C) Nickel (D) Copper

7. Transitional elements exhibit variable valencies because they release electrons from the following orbits

(A) *ns* orbit

(B) *ns* and *np* orbits

(C) $(n-1)d$ and *ns* orbits

(D) $(n-1)d$ orbit

8. The number of unpaired electrons in Zn^{++} is

(A) 2 (B) 3

(C) 4 (D) 0

9. Which element belongs to *d* – block

(A) Na (B) Ca

(C) Cu (D) Ar

10. The element having general electronic configuration $3d^4 4s^1$ is

(A) Noble gas (B) Non-metal

(C) Metalloid (D) Transition metal

11. Variable valency is shown by

(A) Na (B) Cu

(C) Mg (D) Al

12. Which of the following general configuration of outermost shell represents chromium element [*Cr*'s atomic number = 24]

(A) $d^5 s^1$ (B) $d^6 s^0$

(C) $d^4 s^2$ (D) $d^3 s^2$

13. An elements in+3 oxidation state has the electronic configuration $(Ar)3d^3$. Its atomic number is

(A) 24 (B) 23

(C) 22 (D) 21

14. *Zn* is related to which group

(A) II*B* (B) II*A*

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

15. What is the general electronic configuration for 2nd row transition series

(A) $[Ne]3d^{1-10}, 4s^2$ (B) $[Ar]3d^{1-10}, 4s^{1-2}$

(C) $[Kr]4d^{1-10}, 5s^{1-2}$ (D) $[Xe]5d^{1-10}, 5s^{1-2}$

16. The number of unpaired electrons in cobalt atom is (atomic number of *Co* = 27)

(A) 2 (B) 3

(C) 4 (D) 1

17. Which of the following represents the electronic configuration of a transition element

(A) $1s^2, 2s^2 p^6 \ldots\ldots ns^2 p^3$

(B) $1s^2, 2s^2 p^6 \ldots\ldots ns^2 p^6 d^3, (n+1)s^2$

(C) $1s^2, 2s^2 p^6 \ldots\ldots ns^2 p^6 d^{10}, (n+1)s^2 p^1$

(D) $1s^2, 2s^2 p^6 \ldots\ldots ns^2 p^6$

18. The general electronic configuration of transition elements is

(A) $(n-1)d^{1-5}$ (B) $(n-1)d^{1-10} ns^1$

(C) $(n-1)d^{1-10} ns^{1-2}$ (D) $ns^2 (n-1)d^{10}$

19. Which of the following has the maximum number of unpaired *d*-electrons

(A) Zn (B) Fe^{2+}

(C) Ni^{3+} (D) Cu^{+}

20. The electronic configuration of cobalt is

(A) $1s^2, 2s^2 2p^6 . 3s^2 3p^6 3d^1, 4s^2$

(B) $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^7, 4s^2$

(C) $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^3, 4s^2$

(D) $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^5, 4s^2$

21. Which of the following transition metal cation has maximum unpaired electrons

(A) Mn^{+2} (B) Fe^{+2}

(C) Co^{2+} (D) Ni^{2+}

22. Number of unpaired electrons in $Fe^{+++}(Z = 26)$ is

(A) 4 (B) 5

(C) 6 (D) 3

23. Which of the following is a transitional element

(A) *Al* (B) *As*

(C) *Ni* (D) *Rb*

24. The valence shell electronic configuration of Cr^{2+} ion is

(A) $4s^o 3d^4$ (B) $4s^2 3d^2$

(C) $4s^2 3d^0$ (D) $3p^6 4s^2$

25. Lanthanum is grouped with *f*-block elements because

(A) It has partially filled *f* -orbitals

(B) It is just before *Ce* in the periodic table

(C) It has both partially filled *f* and *d*-orbitals

(D) The properties of Lanthanum are very similar to the elements of 4*f* block

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CHEMISTRY

DPP-1

Basic Chemistry

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	C	A	D	D	B	C	D	C	D	B	A	A	A	C
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**					
B	B	C	B	B	A	B	C	A	D					

जैवअणु
Biomolecule

1. Which of the following monosaccharide is a pentose
(A) Galactose (B) Glucose
(C) Fructose (D) Arabinose

2. General formula for carbohydrates is
(A) $C_nH_{2n}O_{2n+2}$ (B) $C_x(H_2O)_{2x}$
(C) $C_x(H_2O)_y$ (D) None of these

3. The change in optical rotation, with time, of freshly prepared solution of sugar is known as
(A) Rotatory motion (B) Inversion
(C) Specific rotation (D) Mutarotation

4. Benedict solution provides
(A) Ag^+ (B) Li^+
(C) Cu^{+2} (D) Ba^{+2}

5. Glucose when heated with CH_3OH in presence of dry HCl gas gives α and $\beta-$methyl glucosides because it contains
(A) An aldehyde group (B) A $-CH_2OH$ group
(C) A ring structure
(D) Five hydroxyl groups

6. Glucose gives silver mirror with Tollen's reagent. It shows the presence of
(A) An acidic group
(B) An alcoholic group
(C) A ketonic group
(D) An aldehydic group

7. Which one is a disaccharide
(A) Glucose (B) Fructose
(C) Xylose (D) Sucrose

8. The '*epimerisation*' involves
(A) Change of configuration
(B) Addition of one more '*C*'
(C) Substration of a '*C*'
(D) Conversion of $-CHO$ to $-C=O$

9. Which of the following sign indicate that the sugar is actually '*dextrorotatory*'
(A) – (B) +
(C) *R* – (D) All of these

10. Hydrolysis of sucrose is called
(A) Esterification (B) Saponification
(C) Inversion (D) Hydration

11. The commonest disaccharide has the molecular formula
(A) $C_{10}H_{18}O_9$ (B) $C_{10}H_{20}O_{10}$
(C) $C_{18}H_{22}O_{11}$ (D) $C_{12}H_{22}O_{11}$

12. On complete hydrolysis of starch, we finally get
(A) Glucose (B) Fructose
(C) Glucose and fructose
(D) Sucrose

13. A carbohydrate consists of
(A) *C* and *O* (B) *C*, *H* and *O*
(C) *C*, *H*, *N* and *O* (D) *C* and *H*

14. Which one of the following compounds is found abundantly in nature
(A) Fructose (B) Starch
(C) Glucose (D) Cellulose

15. The correct name of 'sucrose' is
(A) $\alpha-D-$glucopyranosyl$-\beta-D-$fructofuranoside
(B) $\beta-D-$glucopyranosyl$-\beta-D-$fructofuranoside
(C) $\alpha-D-$glucopyranosyl$-\alpha-D-$fructofuranoside
(D) $\beta-D-$glucopyranosyl$-\alpha-L-$fructofuranoside

16. Glucose forms many derivatives. The derivative which will help to prove the furanose structure is
(A) Acetyl (B) Benzoyl
(C) Osazone (D) Isopropylidene

17. The hydrolysis of sucrose produces a mixture which is
(A) Laevorotatory
(B) Dextrorotatory
(C) Equally both (+) and (–) rotatory
(D) Optically inactive

18. Sucrose contains which of the following groups
(A) $-CHO$ (B) $>C=O$
(C) Both (A) and (B) (D) None of these

19. Chemically '*digestion*' is
(A) Hydrolysis (B) Change in bacteria
(C) Hydrogenation (D) Dehydrogenation

20. Carbohydrates are stored in human body as
(A) Glucose (B) Glycogen
(C) Starch (D) Fructose

21. Which one of the following is laevorotatory
(A) Glucose (B) Sucrose
(C) Fructose (D) None of these

22. Which carbohydrates has highest abundance in human blood
(A) *d*-fructose (B) *d*-glucose
(C) Sucrose (D) Lactose

23. An example of a disaccharide made up of two units of the same monosaccharides is

(A) Sucrose (B) Maltose

(C) Lactose (D) None of these

24. Starch is a polymer of

(A) Glucose (B) Fructose

(C) Both (A) and (B) (D) None of these

25. Proteins when heated with conc. HNO_3 give a yellow colour. This is

(A) Oxidising test (B) Xanthoprotic test

(C) Hoppe's test (D) Acid-base test

26. Proteins are built up of

(A) Dicarboxylic acids (B) Amino acids

(C) Alcohols (D) Hydroxy acids

27. Pepsin enzyme hydrolyses

(A) Proteins to amino acids

(B) Fats to fatty acids

(C) Glucose to ethyl alcohol

(D) Polysaccharides to monosaccharides

28. Enzymes are

(A) Proteins (B) Minerals

(C) Oils (D) Fatty acids

29. For α – amino acids having the structure

$$R - \underset{\displaystyle NH_2}{\overset{\displaystyle |}{CH}} - CO_2H$$

Which of the following statements are true

(A) Water solubility is maximum at a *pH* when concentrations of anions and cations are equal

(B) They give ninhydrin test

(C) On reacting with nitrous acid give off N_2

(A) All (B) B and C

(C) A and B (D) A

30. Leucine amino acids is the

(A) Essential (B) Non-essential

(C) Aromatic (D) Basic

CHEMISTRY

जैवअणु
Biomolecule

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	C	D	C	C	D	D	A	B	C	D	A	B	D	A
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	A	D	A	B	C	B	B	A	B	B	A	A	B	A

सामान्य कार्बनिक रसायन
General Organic Chemistry

1. Inductive effect involves :
(A) delocalisation of σ-electrons
(B) delocalisation of π-electrons
(C) displacement of σ-electrons
(D) displacement of π-electrons

2. Arrange following compounds in decreasing order of their dipole moment.

I $CH_3—CH_2—NO_2$ II $CH_3—CH_2—Cl$

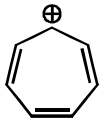
III $CH_3—CH_2—Br$ IV $CH_3—CH_2—I$

(A) IV > III >I > II (B) IV > I > III > II
(C) I > III > IV > II (D) I > II > III > IV

3. Decreasing –I effect of given groups is :
(i) –CN (ii) $–NO_2$
(iii) $–NH_2$ (iv) –Cl
(A) iii > ii > i > iv (B) ii > iii > iv > i
(C) iii > ii > iv > i (D) ii > i > iv > iii

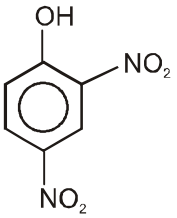
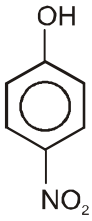
4. Resonance structures of a molecule do not have :
(A) Identical bonding
(B) Identical arrangement of atoms
(C) The same number of paired electrons
(D) Nearly the same energy content

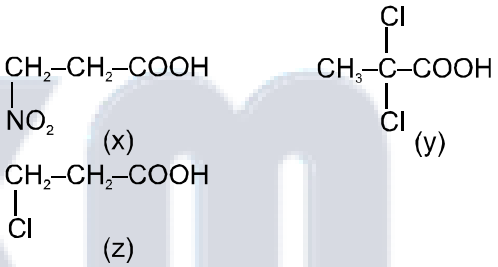
5. Arrange the following groups in order of decreasing –m effect.
(i) NO_2 (ii) COOH
(iii) CN (iv) CHO
(A) i > iii > ii > iv (B) i > ii > iii > iv
(C) i > iii > iv > ii (D) iv > iii > ii > i

6. Which of the following molecules are aromatic hydrocarbon?
(A)  (B) 
(C)  (D) All of these

7. The stability of given free radicals in decreasing order is :
(i) $CH_3–\dot{C}H_2$ (ii) $CH_3–\dot{C}H–CH_3$
(iii) $CH_3–\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\dot{C}}}}–CH_3$ (iv) $\dot{C}H_3$
(A) iii > iv > i > ii (B) i > ii > iii > iv
(C) iii > ii > iv > i (D) iii > ii > i > iv

8. Strongest acid among the following is :
(A) CF_3 COOH (B) CCI_3 COOH
(C) CBr_3COOH (D) CH_3COOH

9. Strength of acidity is in order :
(I) 
(II) 
(III) 
(IV) 
(A) II > I > III > IV (B) III > IV > I > II
(C) I > IV > III > II (D) IV > III > I > II

10. What is the correct order of acidic strength in following compounds ?

(A) x > y > z (B) y > x > z
(C) x > z > y (D) z > y > x

11. Which of the following shows the correct order of decreasing basicity in aqueous medium ?
(A) $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2 > NH_3$
(B) $(CH_3)_2NH > (CH_3)_3N > CH_3NH_2 > NH_3$
(C) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N > NH_3$
(D) $(CH_3)_2NH > CH_3NH_2 > NH_3 > (CH_3)_3N$

12. Which of the following shows the correct order of decreasing basicity in aqueous medium ?
(A) $(C_2H_5)_3N > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$
(B) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2 > NH_3$
(C) $(C_2H_5)_2NH > C_2H_5NH_2 > (C_2H_5)_3N > NH_3$
(D) $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3 > (C_2H_5)_3N$

13. Which of the following shows the correct order of decreasing basicity in gas phase ?
(A) $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2 > NH_3$
(B) $(CH_3)_2NH > (CH_3)_3N > CH_3NH_2 > NH_3$
(C) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N > NH_3$
(D) $(CH_3)_2NH > CH_3NH_2 > NH_3 > (CH_3)_3N$

14. Each carbon atom in benzene is in the state of hybridization
(A) sp^3 (B) sp^2
(C) sp (D) s^3p

15. The compound, which gives the most stable carbonium on dehydrogenation

(A) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}} - CH_2OH$

(B) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{C}}} - OH$

(C) $CH_3 - CH_2 - CH_2 - CH_2OH$

(D) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}} - CH_2 - CH_3$

16. The electrophile in the nitration of benzene is

(A) NO_2^+ (B) NO_2

(C) NO^+ (D) NO_2^-

17. An alkyl halide may be converted into an alcohol by

(A) Elimination (B) Addition

(C) Substitution

(D) Dehydrohalogenation

18. Elimination of bromine from 2-bromobutane results in the formation of

(A) Equimolar mixture of 1 and 2-butene

(B) Predominantly 2-butene

(C) Predominantly 1-butene

(D) Predominantly 2-butyne

19. Geometry of reaction intermediate in SN^1 reaction is

(A) Tetrahedral

(B) Planar

(C) Triangular bipyramidal

(D) None of these

20. $\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{H_3C - C}}} - Br + KOH(Aq.) \rightarrow H_3C - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{C}}} - OH + KBr$

above reaction is

(A) SN^1 (B) SN^2

(C) E_1 (D) Both (A) and (B)

21. The function of $AlCl_3$ in Friedel-Craft's reaction is

(A) To absorb HCl

(B) To absorb water

(C) To produce nucleophile

(D) To produce electrophile

22. Which of the following can't be used in Friedal Craft's reactions

(A) $FeCl_3$ (B) $FeBr_2$

(C) $AlCl_3$ (D) $NaCl$

23. Dehydrohalogenation of an alkyl halide is a/an

(A) Nucleophilic substitution reaction

(B) Elimination reaction

(C) Both nucleophilic substitution and elimination reaction

(D) Rearrangement

24. Which is an electrophile

(A) $AlCl_3$ (B) CN^-

(C) NH_3 (D) CH_3OH

25. Conversion of CH_4 to CH_3Cl is an example of which of the following reaction

(A) Electrophilic substitution

(B) Free radical addition

(C) Nucleophilic substitution

(D) Free radical substituion

26. Which represents nucleophilic aromatic substitution reaction

(A) Reaction of benzene with Cl_2 in sunlight

(B) Benzyl bromide hydrolysis

(C)` Reaction of $NaOH$ with dinitrofluorobenzene

(D) Sulphonation of benzene

27. Following reaction, $(CH_3)_3CBr + H_2O \rightarrow (CH_3)_3COH + HBr$ is an example of

(A) Elimination reaction

(B) Free radical substitution

(C) Nucleophilic substitution

(D) Electrophilic substitution

28 The reagent in Friedel Craft's reaction is

(A) Pyridine (B) $RCOCl$

(C) $RCOOH$ (D) HCl

29 Which of the following alkyl groups has the maximum + I effect

(A) $CH_3 -$ (B) $(CH_3)_2CH -$

(C) $(CH_3)_3C -$ (D) $CH_3CH_2 -$

30. Isomers have essentially identical

(A) Structural formula

(B) Chemical properties

(C) Molecular formula

(D) Physical properties

CHEMISTRY

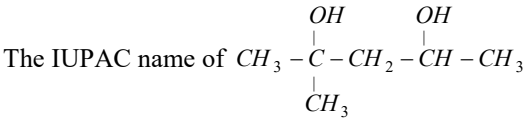
सामान्य कार्बनिक रसायन
General Organic Chemistry

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	D	D	A	C	D	D	A	B	B	C	B	A	B	B
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	C	B	B	A	D	D	B	A	D	B,C	C	B	C	C

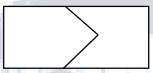
IUPAC नामकरण
IUPAC Nomenclature

1. The IUPAC name of  is

(A) 4-methyl-2, 4, pentanediol
(B) 1, 1-dimethyl 1, 1, 3 butanediol
(C) 2-methyl-2, 4 pentanediol
(D) 1, 2, 3-trimethyl-1, 3 propanediol

2. Which of the following compound have wrong IUPAC name

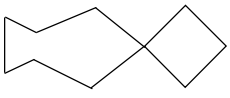
(A) $CH_3-CH_2-CH_2-COO-CH_2CH_3 \rightarrow$ ethyl butanoate
(B) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-CHO \rightarrow 3$ methyl-butanal
(C) $CH_3-\underset{\underset{OH}{|}}{CH}-\underset{\underset{CH_3}{|}}{CH}-CH_3 \rightarrow 2$ methyl-3-butanol
(D) $CH_3-\underset{\underset{CH_3}{|}}{CH}-\overset{\overset{O}{\|}}{C}-CH_2-CH_3 \rightarrow$ 2-methyl-3-pentanone

3  is named as

(A) Bicyclo (2, 2, 1) heptane
(B) Bicyclo (2, 2, 2) hexane
(C) Bicyclo (2, 2, 1) hexane
(D) Bicyclo (2, 1, 0) hexane

4. The IUPAC name for $CH_3CHOHCH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_2}{|}}{C}}-OH$ is

(A) 1, 1-dimethyl-1, 3-butanediol
(B) 2-methyl-2, 4-pentanediol
(C) 4-methyl-2, 4-pentanediol
(D) 1, 3, 3-trimethyl-1, 3-propanediol
(D) 1, 3, 3- ट्रायमिथाइल -1, 3-प्रोपेनडाओॅल

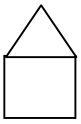
5. The IUPAC name of the compound  is

||

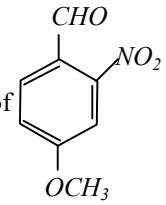
(A) 1, 1-cyclobutylheptane
(B) Bicyclo [6, 3, 0] nonane
(C) Spiro [3, 6] decane
(D) Spiro [6, 3] decane

6. The IUPAC name of the following compound is $CH_3-\underset{\underset{CH(CH_3)_2}{|}}{CH}-CH_2CH_2CH_3$

(A) 2-isopropylpentane
(B) 2, 3-dimethylhexane
(C) Isononane
(D) 2, 4-dimethylhexane

7. The IUPAC name of  is

(A) Bicyclo (2, 1, 0) pentane
(B) 1, 2-cyclopropyl cyclobutane
(C) Cyclopentane (4, 3) annulene
(D) 1, 2-methylene cyclobutane

8. What is the correct IUPAC name of 

(A) 4-methoxy-2-nitrobenzaldehyde
(B) 4-formyl-3-nitro anisole
(C) 4-methoxy-6-nitrobenzaldehyde
(D) 2-formyl-5-methoxy nitrobenzene

9. The IUPAC name of the compound $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-CH_2-Cl$

(A) 1-chloro-3-methylbutane
(B) 2-methyl-4-chlorobutane
(C) 2-methyl-1-chlorobutane
(D) 1-chloropentane

10. The name of $H_3C-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3$ IUPAC nomenclature system is

(A) Butanol (B) 2-methyl butanol-3
(C) 3-methyl butanol-2 (D) Pentanol

11. The IUPAC name of *n*-butyl chloride is

(A) 1-chlorobutane (B) *n*-chlorobutane
(C) Ter-butylchloride (D) 2-methylbutane

12. IUPAC name of $(CH_3)_3C-CH=CH_2$ is

(A) 3, 3, 3-trimethyl-1-propene
(B) 1, 1, 1-trimethyl-2-propene
(C) 3, 3-dimethyl-1-butene
(D) 2, 2-dimethyl-3-butene

13. IUPAC name of $CH_3-O-C_2H_5$ is

(A) Ethoxymethane (B) Methoxyethane
(C) Methylethyl ether (D) Ethylmethyl ether

14. IUPAC name of the compound $CH_3-CH=\underset{\underset{CH_2-CH_3}{|}}{C}-CH_3$ is

(A) 2-ethyl-2-butene (B) 3-ethyl-2-butene
(C) 3-methyl-3-pentene (D) 3-methyl-2-pentene

15. The IUPAC name of $CH_3C\equiv N$ is

(A) Acetonitrile (B) Ethanenitrile
(C) Methyl cyanide (D) Cyanoethane

16. IUPAC name of $CH_2=CH-CH(CH_3)_2$ is

(A) 1, 1-dimethyl-2-propene
(B) 3-methyl-1-butene
(C) 2-vinyl propane
(D) 1-isopropyl ethylene

17. Correct name of the compound $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_3$ is

(A) Butane (B) Isopropyl methane
(C) 2-methyl propane (D) Dimethyl ethane

18. The IUPAC name of the following structure is $CH_3 - \underset{\underset{O}{\|}}{C} - CH_2 - COOH$

(A) 3-ketobutanoic acid (B) 2-ketobutanoic acid
(C) 4-ketobutanoic acid (D) 3-oxopropanoic acid

19. The IUPAC name of the compound having structure $C_2H_5 - \underset{\underset{CH_2}{\|}}{C} - \underset{\underset{CH_3}{|}}{CH} - CH_3$

(A) 3-methyl-2-ethylbutene-1
(B) 2-ethyl-3-methylbutene-1
(C) 3-ethyl-3-methylbutene-1
(D) Ethyl isopropyl ethane

20. The IUPAC name of the compound $CH_3 - \underset{\underset{OH}{|}}{C} = CH - CH_2 - COOH$ is

(A) Hydroxypentenoic acid
(B) 4-hydroxy-3-pentenoic acid
(C) 4-hydroxy-4-pentenoic acid
(D) 4-hydroxy-4-methyl-3-butenoic acid

21. The IUPAC name of $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - \underset{\underset{CH_3}{|}}{CHCHO}$ is

(A) 4 hydroxy-2-methyl pentanal
(B) 2-hydroxy-4-methyl pentanal
(C) 2-methyl pent-4-ol-1-al
(D) None of these

22. IUPAC name of tertiary butyl alcohol is

(A) Butan-1-ol
(B) Butan-2-ol
(C) 2-methyl propan-1-ol
(D) 2-methyl propan-2-ol

23. IUPAC name of the following are $CH_3 - \underset{\underset{CH_3}{|}}{N} - \underset{\underset{C_2H_5}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - CH_3$

(A) 3-dimethylamino-3-methyl pentane
(B) 3 (N, N-Trimethyl)-3-aminopentane
(C) 3, (N, N-Trimethyl) pentanamine
(D) 3-N, N dimethyl amino-3-methyl pentane

24. IUPAC name of $CH_3 - \underset{\underset{CH_2CH_3}{|}}{CH} - CHO$ is

(A) Butan-2-aldehyde
(B) 2-methylbutanal
(C) 3-methyl isobutyraldehyde
(D) 2-ethylpropanal

25. The compound  is known by which of the following names

(A) Bicyclo-[2, 2, 2] octane
(B) Bicyclo-[2, 2, 1] octane
(C) Bicyclo-[1, 2, 1] octane
(D) Bicyclo-[1, 1, 1] octane

26. The IUPAC name of $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CHO$

will be

(A) 4-hydroxy-1-methylpentanal
(B) 4-hydroxy-2-methylpentanal
(C) 3-hydroxy-2-methylpentanal
(D) 3-hydroxy-3-methylpentanal

27. The compound  is known by which of the following names

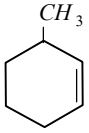
(A) Bicyclo-[2, 2, 2] octane
(B) Bicyclo-[2, 2, 1] octane
(C) Bicyclo-[1, 2, 1] octane
(D) Bicyclo-[1, 1, 1] octane

28. IUPAC name of the compound $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_3$ is

(A) 4-methyl pentene-2-ol
(B) 2-methyl pentanol-4
(C) 4, 4-dimethyl butan-2-ol
(D) 4-methyl pentane-2-ol

29. The correct IUPAC name for  is

(A) Neononane
(B) Tetraethylmethane
(C) 3-Ethylpentane
(D) 3, 3-Diethylpentane

30. IUPAC name of the following compound  is

(A) 3-methyl cyclohexene
(B) 1-methyl cyclohex-2-ene
(C) 6-methyl cyclohexene
(D) 1-methyl cyclohex-5-ene

CHEMISTRY

IUPAC नामकरण
IUPAC Nomenclature

DPP-1

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	C	A	B	C	B	A	A	A	C	B	C	B	D	B
16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	C	A	B	B	C	D	D	B	A	B	A	D	D	A