

CHAPTER 1

PERIODIC CLASSIFICATION OF ELEMENTS AND PERIODICITY

- The number of shells in an element reflects its:**
(a) Period number (b) Group number (c) Both (d) None
- The number of electrons in valence shell of an element reflects its:**
(a) Period number (b) Group number (c) Both (d) None
- Generally metals form oxides:**
(a) Acidic (b) Basic (c) Amphoteric (d) None
- Variable valency is shown by:**
(a) Group 1A (b) Group IIA
(c) Group VIIA (d) Group IB
- Hydrogen can be placed above the groups of the periodic table:**
(a) IA, IVA and VIIA elements (b) VIIA Elements
(c) IIIA, IVA and VA elements (d) IIA, IIIA and VIIA elements
- Members of group IA are called:**
(a) Alkali metals (b) Alkaline earth metals
(c) Halogens (d) Noble gases
- Members of group IB are called:**
(a) Alkali metals (b) Alkaline earth metals
(c) Halogens (d) Coinage metals
- Keeping in view the sizes of atoms, which order is the correct one:**
(a) $Mg > Sr$ (b) $Ba > Mg$ (c) $Be > Mg$ (d) $Ra > Ba$
- Which one of the following oxides is Amphoteric in nature:**
(a) MgO (b) Na_2O (c) SO_2 (d) ZnO
- According to Newland's arrangement of elements recurrence (periodicity) of properties take place at every:**
(a) 8th element (b) 10th element (c) 18th element (d) None
- Atomic number was discovered by Mosley in:**
(a) 1913 (b) 1914 (c) 1915 (d) 1916
- Total groups in modern periodic table:**
(a) 7 (b) 8 (c) 10 (d) 18
- Non-metals usually exist as:**
(a) Liquids (b) Gases
(c) Liquids or gases (d) Waxy solids
- The Ionization energy of Sodium is:**
(a) 500 K.J mol⁻¹ (b) 513 K.J mol⁻¹
(c) 496 K.J mol⁻¹ (d) 480 K.J mol⁻¹
- $SnCl_4$ is a:**
(a) Co-ordinate Covalent Compound (b) Ionic compound
(c) Covalent Compound (d) None of these
- Ga has oxidation state:**
(a) +3 (b) +2 (c) +4 (d) +1
- Hydrides can be classified into:**
(a) Two types (b) Three types
(c) Four types (d) Five types
- Which of the following represents elements in order of increasing atomic radii:**
(a) $I > Br > Cl$ (b) $Li > Na > K$ (c) $He > Ne > Ar$ (d) None

19. **The decrease in nuclear force on valence electrons, because of the increase in number of shells containing electrons and layering above is known as:**
 (a) Resonance effect (b) Shielding effect
 (c) Inductive effect (d) None
20. **Number of elements present in the 5th period of periodic table is:**
 (a) 8 (b) 10 (c) 18 (d) 32
21. **Which element has the largest first ionization energy:**
 (a) Li (b) Na (c) K (d) Rb
22. **Which of the following pairs are chemically dissimilar:**
 (a) Na and K (b) Ba and Sr
 (c) Zr and Hf (d) Ca and Zn
23. **Which of the following elements is most electronegative:**
 (a) Oxygen (b) Chlorine (c) Nitrogen (d) Fluorine
24. **Which of the following has greatest metallic character:**
 (a) Mg (b) Ca (c) Al (d) Cs
25. **Highest Hydration energy is shown by:**
 (a) Na⁺ (b) Mg⁺² (c) Al⁺³ (d) Ga⁺³
26. **Which of the following has highest value of Ionization Energy:**
 (a) Na⁺ (b) Al⁺ (c) Al⁺² (d) Al⁺³
27. **The valence shell electronic structure of an element is ns²np⁵. The element will belong to the group:**
 (a) IA (b) IIA (c) VA (d) VIIA
28. **Which of the following pair of atomic numbers represents IIA elements:**
 (a) 3, 11 (b) 3, 12 (c) 4, 20 (d) 3, 20
29. **Among the following elements the highest value of electron affinity is shown by:**
 (a) F (b) Cl (c) Br (d) I
30. **The force of attraction of an element on shared pair of electron is known as:**
 (a) Covalent bond (b) Ionization potential
 (c) Electron affinity (d) Electronegativity
31. **Alkali metals in each period have:**
 (a) Smallest size (b) Lowest Ionization Energy
 (c) Highest Ionization Energy (d) Lowest atomic radius
32. **The correct order of electron affinity among the following is:**
 (a) F > Cl > Br (b) Br > Cl > F
 (c) Cl > F > Br (d) F > Br > Cl
33. **Which of the following does not exhibit the "periodicity" in properties of the elements:**
 (a) Ionization energy (b) n/p ratio
 (c) Electronegativity (d) Atomic radius
34. **Polymeric (Intermediate) hydride shall be formed by:**
 (a) Na (b) K (c) Be (d) C
35. **The highest acidity is shown by:**
 (a) Mn₂O₇ (b) Mn₂O₃ (c) MnO₂ (d) MnO
36. **The covalent hydrides are usually:**
 (a) Liquids (b) Gases
 (c) Volatile Liquids or gases (d) Waxy solids
37. **Which of the following is not iso-electronic with others:**
 (a) Na⁺ (b) Mg²⁺ (c) O²⁻ (d) Cl⁻
38. **Which of the following oxides is Amphoteric in character:**
 (a) CaO (b) CO₂ (c) SiO₂ (d) Sb₂O₃
39. **The melting point is lowest for:**
 (a) Be (b) Mg (c) Ca (d) Sr

- 40. Which of the following is not true for metalloids:**
 (a) They are borderline elements that exhibit both metallic and non-metallic properties
 (b) They usually act as electron donors to non-metals
 (c) They usually act as electron acceptors from metals
 (d) They are good conductor of heat and electricity
- 41. Among the pure ionic compounds, the ----- have the highest lattice energies:**
 (a) Fluorides (b) Chlorides (c) Bromides (d) Iodides
- 42. Which electronic sub-shell in lanthanides is incompletely filled:**
 (a) 4f (b) 5f (c) 6f (d) All
- 43. The number of elements in fourth period of periodic table is: (GRW 2011)**
 (a) 32 (b) 18 (c) 10 (d) 8
- 44. The basis of modern periodic law is: (FSD, BWP, GRW 2012)**
 (a) Electron affinity (b) atomic mass
 (c) Ionization energy (d) atomic number
- 45. The highest ionization energy is possessed by: (GRW 2011)**
 (a) Nitrogen (b) Phosphorous
 (c) Bismuth (d) Antimony
- 46. The decrease in atomic sizes is much prominent across rows containing elements of:**
 (a) s & p-block (b) d-block
 (c) f-block (d) All
- 47. Mark the correct statement:**
 (a) All lanthanides are present in the same group
 (b) All halogens are present in the same period
 (c) All the alkali metals are present in the same group
 (d) All the noble gases are present in the same period.
- 48. Encircle the correct statement:**
 (a) Metallic character increases down the group
 (b) Metallic character increases along a period
 (c) Metallic character remains the same along a period
 (d) Metallic character remains the same down the group
- 49. In Potassium super oxide (KO₂) oxidation state of O is:**
 (a) -1 (b) -2 (c) -1/2 (d) -4
- 50. Hydrogen can be placed with the element of group (IV-A) because both:**
 (a) Act as strong oxidizing agent (b) Act as strong reducing agent
 (c) Possess the property of catenation (d) Form neutral oxides

ANSWER KEY

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

CHAPTER 2

S-BLOCK ELEMENTS

- Which of the following sulphates is not soluble in water:**
(a) Sodium sulphate (b) Potassium sulphate
(c) Zinc sulphate (d) Barium sulphate
- Chile Salt peter has the chemical formula:**
(a) NaNO_3 (b) KNO_3
(c) $\text{Na}_2\text{B}_4\text{O}_7$ (d) $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$
- Which one of the following compounds when dissolved in water reacts with CO_2 :**
(a) Calcium chloride (b) Sodium chloride
(c) Calcium Sulphate (d) Calcium hydroxide
- The main product of the reaction of potassium with oxygen is**
(a) KOH (b) K_2O_2 (c) KO_2 (d) K_2O
- The alkali metal whose carbonate is relatively less stable to heat and decomposes on heating, giving its oxides is:**
(a) Li (b) Ba (c) K (d) Rb
- Which of the following compounds has a per oxide linkage:**
(a) BaO_2 (b) CO_2 (c) PbO_2 (d) SiO_2
- Which of the following does not belong to alkaline earth metals:**
(a) Be (b) Mg (c) Ra (d) Rb
- Which does not belong to alkali metals:**
(a) Cs (b) Fr (c) Na (d) Ca
- The oxides of beryllium are:**
(a) Acidic (b) Neutral
(c) Basic (d) Amphoteric
- Nelson's cell is used to prepare:**
(a) Sodium hydroxide (b) Sodium carbonate
(c) Sodium metal (d) Sodium bicarbonate
- What is deposited at the cathode during the electrolysis of brine:**
(a) Na (b) H_2 (c) Cl_2 (d) OH
- Which of the following is a rare radioactive element:**
(a) Fr (b) Cs (c) Ra (d) Rb
- The chemical formula of Magnesite is:**
(a) MgCl_2 (b) $\text{Mg}(\text{ClO}_3)_2$
(c) MgCO_3 (d) None of these
- Which carbonate of alkali metals is insoluble in water:**
(a) Na_2CO_3 (b) K_2CO_3 (c) Li_2CO_3 (d) Cs_2CO_3
- Ga has most common oxidation state of:**
(a) +3 (b) +2 (c) +4 (d) +1
- Alkali metals form:**
(a) Ionic compounds (b) Covalent compounds
(c) Coordinate covalent compounds (d) None of these
- Li_2O is:**
(a) Orange yellow solid (b) White solid
(c) Greenish solid (d) Pale yellow solid
- Melting point of pure sodium chloride is:**
(a) 600°C (b) 775°C (c) 750°C (d) 801°C
- Lime (CaO) is obtained by thermal decomposition of:**
(a) $\text{Ca}(\text{OH})_2$ (b) CaCO_3 (c) CaHCO_3 (d) None

- 20. The element necessary for normal "leaf" development is:**
 (a) Phosphorus (b) Sulphur
 (c) Calcium (d) Magnesium
- 21. Lime is often used as:**
 (a) Reducing Agent (b) Oxidizing Agent
 (c) Dehydrating Agent (d) Catalytic Agent
- 22. Sodium metal can be stored in:**
 (a) Alcohol (b) Kerosene oil (c) H₂O (d) All
- 23. Which of the following alkali metal hydroxide is the strongest base:**
 (a) LiOH (b) NaOH (c) KOH (d) CsOH
- 24. Washing soda has the formula:**
 (a) Na₂CO₃·7H₂O (b) Na₂CO₃·10 H₂O (c) Na₂CO₃·3H₂O (d) Na₂CO₃
- 25. Which halide has the highest melting point:**
 (a) NaCl (b) NaBr (c) NaF (d) NaI
- 26. The alkali metal that reacts with nitrogen directly to form Nitride is:**
 (a) Li (b) Na (c) K (d) Rb
- 27. The electronic configuration of metal (M) is 1s², 2s², 3s¹. The formula of its oxide would be :**
 (a) MO (b) M₂O (c) M₂O₃ (d) MO₂
- 28. An aqueous solution of sodium carbonate is alkaline because sodium carbonate is a salt of:**
 (a) Weak acid and weak base (b) Strong acid and weak base
 (c) Weak acid and strong base (d) Strong acid and strong base
- 29. Which of the following is a man-made element?**
 (a) Ra (b) Fr (c) Rn (d) Cs
- 30. Dolomite has the composition**
 (a) KCl·MgCl₂·6H₂O (b) Na₃AlF₆
 (c) CaCO₃·MgCO₃ (d) CaCl₂·MgCl₂·6H₂O
- 31. Epsom salt is:**
 (a) Magnesium sulphate (b) Ferrous ammonium sulphate
 (c) Magnesium ammonium phosphate (d) Calcium sulphate
- 32. Plaster of Paris is a hydrate of:**
 (a) BaSO₄ (b) CaSO₄ (c) MgSO₄ (d) ZnSO₄
- 33. Which of the following on heating above 100°C gives plaster of Paris:**
 (a) Borax (b) Gypsum (c) Alum (d) Calomel
- 34. On heating quick lime with coke in an electric furnace, we get:**
 (a) Ca and CO₂ (b) CaCO₃ (c) Ca+CO (d) CaC₂
- 35. The substance not likely to contain CaCO₃ is :**
 (a) Dolomite (b) Marble
 (c) Gypsum (d) Sea shells
- 36. The oxide of Beryllium is:**
 (a) Acidic (b) Basic
 (c) Amphoteric (d) None of these
- 37. Point out the ore of potassium:**
 (a) Dolomite (b) Cryolite
 (c) Bauxite (d) Carnallite
- 38. Dolomite is an ore of:**
 (a) Strontium (b) Magnesium
 (c) Barium (d) Potassium
- 39. Which is not an alkali metal?**
 (a) Francium (b) Cesium (c) Rubidium (d) Radium

- 40. Chile salt peter has the chemical formula:**
 (a) NaNO_3 (b) KNO_3
 (c) $\text{Na}_2\text{Br}_4\text{O}_7$ (d) $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$
- 41. The milk of magnesia is used for the treatment of:**
 (a) Acidity (b) Basicity
 (c) Rancidity (d) Jaundice
- 42. Cement contains gypsum: (LHR 2012)**
 (a) 3% (b) 2% (c) 0.2% (d) 0.3%
- 43. Dolomite is: (LHR 08,12)**
 (a) CaCO_3 (b) $\text{MgCO}_3 \cdot \text{CaCO}_3$ (c) MgCO_3 (d) Na_2CO_3
- 44. Chemical formula of Magnesite is: (FSD 2009)**
 (a) $\text{CaMg}_3(\text{SiO}_3)_4$ (b) MgCO_3 (c) MgSO_4 (d) MgCl_2
- 45. Which one does not belong to alkaline earth metals? (MTN 08,15, FSD 09,15, RWP 12, GRW 14,15)**
 (a) Be (b) Ra (c) Ba (d) Rn
- 46. The substance deposited at the cathode during electrolysis of brine in diaphragm cell: (FSD 10,14, BWP 10, LHR 14)**
 (a) Na (b) H_2 (c) Cl_2 (d) O_2
- 47. The ore $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ has general name: (BWP 14, FSD 11,13)**
 (a) Gypsum (b) Dolomite
 (c) Calcite (d) Epsom salt
- 48. The only alkaline earth metal which forms peroxide is: (SGD 2010)**
 (a) Beryllium (b) Magnesium (c) Calcium (d) Barium
- 49. The sulphate compound insoluble in water is: (SGD 2010)**
 (a) Barium sulphate (b) Sodium sulphate
 (c) Potassium sulphate (d) Zinc sulphate
- 50. CaCl_2 is added to NaCl in Down's cell to: (SGD 2011)**
 (a) Decrease solubility (b) Decrease dissociation
 (c) Decrease Melting point (d) Decrease conductivity

ANSWER KEY

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

CHAPTER 3

GROUP III A AND GROUP IV A ELEMENTS

- Gibbsite contain _____ water molecules:**
(a) 6 (b) 5 (c) 4 (d) 3
- Sindur used by Indian women is chemically:**
(a) PbO (b) PbO₂ (c) Pb₃O₄ (d) PbCO₃
- Corundum is:**
(a) Al₂O₃ (b) Na₃AlF₆
(c) Al₂O₃.2H₂O (d) Al₂O₃.3H₂O
- Which one of the following is not an ore of Aluminum:**
(a) Corundum (b) Bauxite (c) Colemanite (d) Kaolin
- Which one of the following is not a use of boric acid:**
(a) Antiseptic (b) Glaze
(c) Stiffening agent for candle wick (d) Lubricant
- Which of the following reactions of Al is used in a photo flash:**
(a) $2\text{Al} + 3\text{H}_2 \rightarrow 2\text{AlH}_3$ (b) $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$
(c) $2\text{Al} + \text{N}_2 \rightarrow 2\text{AlN}$ (d) $2\text{Al} + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3$
- Two elements frequently used for making transistors are:**
(a) C and Si (b) Ga and In
(c) P and As (d) Si and Ge
- Which one of the following is not a use of red lead, Pb₃O₄:**
(a) Red Pigment (b) Flint Glass
(c) Ceramic glazes (d) Semiconductor
- In the dried up lakes of Tibet and California _____ is found:**
(a) Boric acid (b) Colemanite (c) Borax (d) All
- What is the formula of Kaolin (Clay):**
(a) Al₂O₃.SiO₄ (b) Al₂O₃
(c) Al₂O₃.2H₂O (d) Al₂O₃.2SiO₂.2H₂O
- Boric acid is formed when borax reacts with:**
(a) NaCl (b) NaOH (c) HCl (d) H₂CO₃
- Ethyl borate is formed when boric acid is reacted with:**
(a) Ethyl Chloride (b) Ethyl Bormide
(c) Ethyl Alcohol (d) Ethyl Acetate
- Which of the following is a weak acid:**
(a) Na₂SO₄ (b) HCl
(c) Boric Acid (d) None of these
- Talc is used in:**
(a) Talcum powders (b) Face powders
(c) Making of house hold articles (d) All
- The Chemical formula of Lead sub oxide:**
(a) PbO (b) Pb₂O (c) Pb₂O₃ (d) Pb₃O₄
- The Chemical formula for white lead is:**
(a) PbCO₃ (b) Pb₃O₄ (c) 2PbCO₃.Pb(OH)₂ (d) Pb₂O₃
- Which metal is protected by a layer of its own oxide:**
(a) Al (b) Zn (c) Sn (d) Pb
- Inert pair effect plays an important role in case of:**
(a) F (b) Al (c) Si (d) Pb

19. **Alum is not used:**
 (a) To jam Radar (b) To insulate buildings
 (c) Construction of ships (d) Making milk storage tanks
20. **Al is badly corroded by:**
 (a) Pure water (b) Salt solutions
 (c) Dil. H_2SO_4 (d) Dil. HNO_3
21. **B_2H_6 is an example of:**
 (a) Ionic hydride (b) Molecular addition compound
 (c) Good oxidizing agent (d) None
22. **Aluminium reacts with caustic soda to form:**
 (a) Aluminium hydroxide (b) Aluminium oxide
 (c) Sodium aluminium hydroxide (d) None
23. **Compounds of Boron behave as Lewis acids because of:**
 (a) Electron donation (b) Electron deficiency of Boron
 (c) Non-metallic nature of Boron (d) Small size of Boron
24. **BF_3 acts as acid according to the concept of:**
 (a) Lewis (b) Bronsted-Lowry
 (c) Arrhenius (d) None
25. **The non-polar oxide is:**
 (a) H_2O (b) CO_2 (c) CO (d) All
26. **The semiconductor material among following is:**
 (a) Si (b) Ge (c) PbS (d) All
27. **In Borax bead test, when borax is heated with cobalt oxide it forms bead of:**
 (a) Black colour (b) Blue colour
 (c) Red colour (d) Green colour
28. **Chemical composition of Colemanite is:** (SGD 14, GRW 06, BWP 12)
 (a) $\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$ (b) $\text{CaB}_4\text{H}_7 \cdot 4\text{H}_2\text{O}$
 (c) $\text{CaNaB}_5\text{O}_9 \cdot 8\text{H}_2\text{O}$ (d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$
29. **Basic lead chromate is formed when lead chromate is boiled with:**
 (a) Dilute alkali hydroxide (b) Dilute acid
 (c) Strong alkali hydroxide (d) Strong acid
30. **Which of the following is used in making fire proof clothes?** (LHR 2011)
 (a) Water glass (b) Borax glass
 (c) Kaolin (d) Asbestos
31. **Orthoboric acid when heated to red hot gives:** (GRW 2011)
 (a) Boric anhydride (b) Pyroboric acid
 (c) Metaboric acid (d) Tetraboric acid
32. **S, Se, Te and Po are called:** (FSD 2009)
 (a) Coinage metals (b) Alkali metals
 (c) Chalcogens (d) Halogens
33. **Aluminum oxide is:** (BWR, RWP, MTN 15, LHR 14,15, FSD 09,13)
 (a) Acidic oxide (b) Basic oxide
 (c) Amphoteric oxide (d) None of these
34. **Boric acid reacts with caustic soda to produce:** (FSD 2010)
 (a) NaBO_2 (b) NaH_2BO_3 (c) $\text{Na}_2\text{B}_4\text{O}_7$ (d) Na_3BO_3
35. **Ordinary glass is:** (FSD 2011)
 (a) Potassium silicate (b) Calcium silicate
 (c) Sodium silicate (d) Calcium and sodium silicate
36. **The compound which forms the bead in Borax bead test is:** (LHR 08, SGD 09)
 (a) Metal oxide (b) Metal boride
 (c) Metal borate (d) Metal metaborate

37. **The metal which does not give borax bead test is:** (SGD 2010)
 (a) Cu (b) Cr (c) Ni (d) Al
38. **The aqueous solution of borax is:** (SWL 15, SGD 11)
 (a) Acidic (b) Neutral
 (c) Basic (d) Corrosive
39. **Which one is more stable?** (RWP 2008)
 (a) H_3BO_3 (b) HBO_2 (c) $H_2B_2O_2$ (d) $H_6B_3O_9$
40. **Nitric acid can be transported in a container made up of:** (RWP-09)
 (a) Al (b) Zn
 (c) Cu (d) none of these
41. **Valence shell electronic configuration of the elements of group IIIA is:** (RWP 2011)
 (a) ns^1, np^2 (b) ns^2, np^3 (c) ns^0, np^3 (d) ns^2, np^1
42. **The chief ore of aluminum is:**
 (a) $NaAlF_3$ (b) $Al_2O_3 \cdot 2H_2O$
 (c) Al_2O_3 (d) $Al_2O_3 \cdot H_2O$
43. **The only metal in group IIIA is:**
 (a) Ar (b) Ga (c) B (d) In
44. **$C + SnO_2 \longrightarrow Sn + CO_2$: In this reaction carbon acts as a:**
 (a) Reducing agent (b) Oxidizing agent
 (c) Dehydrating agent (d) none of these
45. **The chemical formula of clay is:**
 (a) $Al_2O_3SiF_4$ (b) Na_3AlF_6
 (c) Al_2O_3 (d) $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$
46. **Which naturally occurring substance is SiO_2 ?**
 (a) Haematite (b) Lime (c) Cryolite (d) Quartz
47. **The highly rigid under cooled liquid silica is called:**
 (a) Silicone (b) Quartz
 (c) Water glass (d) Vitreous silica
48. **Which one of the given is amphoteric in nature?**
 (a) MgO (b) Na_2O (c) SO_2 (d) ZnO
49. **When H_3BO_3 reacts with NaOH, the salt mostly formed is?** (DGK 2009)
 (a) Na_3BO_3 (b) $Na_2B_4O_7$ (c) NaH_2BO_3 (d) $NaBO_2$
50. **Which element forms and ion with charge +3?**
 (a) Carbon (b) Silicone
 (c) Aluminum (d) Beryllium

ANSWER KEY

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

CHAPTER 4

GROUP V A AND IV A ELEMENTS

- The % by volume of N₂ in air is:**
(a) 98 (b) 88 (c) 78 (d) 68
- Which one of the following is an amphoteric oxide:**
(a) SO₂ (b) SO₃ (c) CO₂ (d) Al₂O₃
- In Pyrite burner, the gas produced is:**
(a) SO₃ (b) SO₂ (c) CO₂ (d) NO
- In which substance nitrogen is not present:**
(a) Urea (b) Protein (c) Salt peter (d) Galena
- Oxidation of NO in air produces:**
(a) N₂O (b) N₂O₃ (c) NO₂ (d) NO
- Which of the following is not correct about Phosphorous? (LHR 2008)**
(a) It means light bearing (b) Does not exist free in nature
(c) Bone ash is its rich source (d) has no allotropic forms
- Molecular formula of white phosphorous is: (LHR 2009)**
(a) P₄ (b) P (c) P₃ (d) P₂
- At 18 °C the specific gravity of H₂SO₄ is: (LHR 2010)**
(a) 1.891 (b) 2.101 (c) 1.834 (d) 1.740
- Which of the following elements is most metallic:**
(a) Bi (b) Sb (c) As (d) P
- The anhydride of nitric acid is:**
(a) N₂O₄ (b) N₂O₃ (c) N₂O₅ (d) NO
- Nitrous acid is a:**
(a) Reducing agent (b) Oxidizing agent (c) Both a and b (d) None of these
- Which of the following is a white hygroscopic powder:**
(a) P₂O₃ (b) P₂O₅ (c) P₂O₂ (d) P₂O₄
- Aqua Regia is:**
(a) 3 volumes of HCl+ 1Volume of HNO₂ (b) 3 Volumes of HCl+ 1Volume of HNO₃
(c) 3 volumes of HNO₃+ 1Volume of HCl (d) 3 Volumes of HCl+ 1Volume of H₂SO₄
- Which one of the following elements occur free in nature:**
(a) N (b) P (c) As (d) Sb
- Red phosphorous can be obtained from white Phosphorous by:**
(a) Heating it with Iodine catalyst in vacuum at 250 °C
(b) Distilling it in an inert atmosphere
(c) Dissolving it in CS₂ and crystallizing
(d) Melting it and pouring the liquid into water
- Phosphorus pentoxide is used as:**
(a) A cleansing agent (b) A reducing agent
(c) A bleaching agent (d) A dehydrating agent
- The structure of white phosphorus is:**
(a) Square planar (b) Pyramidal
(c) Tetrahedral (d) Trigonal planer
- Which of the following phosphorus is most reactive:**
(a) Red phosphorus (b) White phosphorus
(c) Scarlet phosphorus (d) Violet phosphorous

19. **Orthophosphoric acid is:**
 (a) Monobasic (b) Dibasic
 (c) Tribasic (d) Tetrabasic
20. **HNO₂ acts as an/a:**
 (a) Acid (b) Oxidizing agent
 (c) Reducing agent (d) All the three
21. **P₂O₅ is heated with water to get:**
 (a) Hypophosphorous acid (b) Phosphorous acid
 (c) Hypophosphoric acid (d) Orthophosphoric acid
22. **Ozone is not:**
 (a) An allotrope (b) A powerful oxidizing agent
 (c) Paramagnetic species (d) A bent molecule
23. **Oleum is:**
 (a) H₂SO₃ (b) H₂SO₄ (c) H₂S₂O₇ (d) None
24. **SO₃ is not directly dissolved in water to get Sulphuric acid because:**
 (a) The reaction does not go to completion (b) The reaction is quite slow
 (c) The reaction is highly exothermic (d) SO₃ is insoluble in water
25. **In group VA the most electronegative element is:**
 (a) N (b) P (c) As (d) Sb
26. **Cinnabar is:**
 (a) HgS (b) ZnS (c) PbS (d) FeS₂
27. **The element whose inorganic minerals are not much abundant in earth crust:**
 (LHR 2011)
 (a) Li (b) N (c) Na (d) O
28. **Gold dissolves in aqua regia to form:** (BWP 09, FSD 10)
 (a) AuCl₃ (b) AuI₃
 (c) AuI₂ (d) Au₂(SO₄)₃
29. **Arsenic oxides are removed during manufacture of H₂SO₄ by passing through:**
 (SGD 2010)
 (a) Ferric hydroxide (b) Sodium hydroxide
 (c) Calcium hydroxide (d) Potassium hydroxide
30. **The compound N₂O causes:** (RWP 2011)
 (a) Cancer (b) Sleeping sickness (c) Hysterical laughter (d) Tumor
31. **H₂SO₄ has great affinity for water because:** (MTN 2008)
 (a) it decomposes the acid (b) it hydrolyses the acid
 (c) acid decomposes water (d) acid forms hydrate with water
32. **Atomic number of Te is:** (MTN 2009)
 (a) 52 (b) 60 (c) 65 (d) 80
33. **Nitric acid, Sulphuric acid and Caustic soda can be transported in a container made up of:** (MTN 2009)
 (a) Aluminum (b) Copper (c) Zinc (d) Teflon
34. **Which of the following elements does not show the phenomena of allotropy?**
 (MTN 2009,10)
 (a) As (b) N (c) Sb (d) all of these
35. **The gas emitted when Zn reduces Conc. HNO₃ is:** (MTN 2010)
 (a) N₂O (b) NO (c) NO₂ (d) N₂O₅
36. **When sugar is treated with conc. H₂SO₄ the sugar becomes black due to:**
 (LHR 13, BWP 08)
 (a) Oxidation (b) Reduction
 (c) Dehydration (d) Combustion
37. **The catalyst used in manufacturing of H₂SO₄ by Contact process is:**
 (DGK, BWP 10, GRW 12)
 (a) V₂O₅ (b) Fe₂O₃ (c) Ni (d) Pt

38. The given element gives NO gas with dil HNO₃: (BWP 2011)
 (a) Zn (b) Cu (c) Mg (d) Sn
39. Which of the following statement is incorrect? (DGK 2009)
 (a) H₂SO₄ acts as a strong oxidizing agent (b) H₂SO₄ acts as a dehydrating agent
 (c) H₂SO₄ acts as a strong reducing agent (d) H₂SO₄ acts as a sulphonating agent
40. Bone ash contains: (DGK 2009)
 (a) 80% P (b) 90% P
 (c) 80% Ca₃(PO₄)₂ (d) 90% Ca₃(PO₄)₂
41. NO₂ is called: (DGK 2011)
 (a) Nitrogen peroxide (b) Nitrous oxide
 (c) Nitric oxide (d) Nitric anhydride
42. Which of the following metal reacts with HNO₃: (BWP 2012)
 (a) Titanium (b) Iridium
 (c) Platinum (d) Magnesium
43. Ortho-phosphoric acid has melting point: (LHR 2012)
 (a) 49 °C (b) 45 °C (c) 41 °C (d) 50 °C
44. Which of the following gas is evolved when copper reacts with dil. HNO₃? (RWP 2009)
 (a) N₂O (b) NO
 (c) NO₂ (d) none of these
45. Which of the following gives brown ring with FeSO₄? (LHR 2014)
 (a) NO₂ (b) NO (c) N₂O₃ (d) NO₃
46. Which metal is rendered passive by HNO₃? (SGD 2014)
 (a) Pt (b) Co (c) Sn (d) Mn
47. Which of the following shows phosphorescence? (LHR 2008)
 (a) Yellow phosphorous (b) white phosphorous
 (c) black phosphorous (d) red phosphorous

ANSWER KEY

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

CHAPTER 5

THE HALOGENS AND THE NOBLE GASES

- Halogen acid in gaseous state found as equilibrium mixture of monomers and hexamers is:**
(a) HF (b) HCl (c) HBr (d) HI
- Color of which halogen is not correctly related:**
(a) F₂ Colorless gas (b) Cl₂ greenish yellow gas
(c) Br₂ Reddish brown liquid (d) I₂ grayish black solid
- Mark the element, which can displace three halogens from their compounds:**
(a) F₂ (b) Cl₂ (c) Br₂ (d) I₂
- The chemical formula of iodic acid is:**
(a) HI (b) HIO (c) HIO₂ (d) HIO₃
- The most inert element in noble gas group is:**
(a) He (b) Ne (c) Ar (d) Kr
- In which compound, the oxidation state of xenon is not +6:**
(a) XeOF₂ (b) XeOF₄ (c) XeO₃ (d) XeF₆
- Radon is formed by the removal of alpha particles from:**
(a) Radium (b) Rhenium
(c) Rhodium (d) Rutherfordium
- Which of the following gases is used in radio therapy for cancer treatment and earthquake predictions?**
(a) Ar (b) Ne (c) Xe (d) Rn
- Chlorine heptoxide (Cl₂O₇) reacts with water to form: (SGD 14, GRW 08, BWP 09)**
(a) hypochlorous acid (b) perchloric acid
(c) chloric acid (d) chlorine and oxygen
- The anhydride of HClO₄ is:**
(a) Cl₂O₇ (b) Cl₂O₅ (c) ClO₃ (d) ClO₂
- Silver bromide is used in: (LHR 2010)**
(a) Paints (b) Photography (c) Ceramics (d) Gasoline
- Which of the following acid is used for etching of glass:**
(a) HF (b) HCl (c) HBr (d) HI
- Oxidation state of chlorine in HClO₄ is:**
(a) -7 (b) +7 (c) -1 (d) +1
- Which is used for making unshrinkable wool:**
(a) HBr (b) I₂ (c) Bleaching powder (d) HCl
- _____ is used for earthquake prediction**
(a) Rn (b) Kr (c) Xe (d) Ar
- Which of the following compound is Carnallite:**
(a) KCl . Mg (OH)₂ . 6H₂O (b) KOH . MgCl₂ . 6H₂O
(c) KOH . Mg(OH)₂ . 6H₂O (d) KCl . MgCl₂ . 6H₂O
- Chlorine dioxide is a:**
(a) Red gas (b) Pale yellow gas
(c) Orange gas (d) Green gas
- Iodine pentoxide acts as a :**
(a) Reducing Agent (b) Oxidizing Agent
(c) Dehydrating Agent (d) None of these
- The Chemical formula of Perchloric acid is :**
(a) HClO (b) HClO₃ (c) HClO₄ (d) HClO₂

- 20. The oxidation states of Xe in its compounds range from:**
 (a) +2 to +8 (b) +3 to +5
 (c) +11 to +8 (d) +3 to +7
- 21. The compounds of Xe are:**
 (a) Saturated (b) Unsaturated
 (c) Stable (d) Unstable
- 22. Which of the following is used to fill fluorescent tubes:**
 (a) Krypton (b) Argon (c) Xenon (d) Neon
- 23. Which is the strongest acid:**
 (a) HI (b) HCl (c) HBr (d) HF
- 24. Which of the following halogens does not form oxyacids:**
 (a) Fluorine (b) Chlorine (c) Bromine (d) Iodine
- 25. Which amongst the following is the smallest atom?**
 (a) F (b) Cl (c) Br (d) I
- 26. Fluorine does not have positive oxidation states due to the absence of**
 (a) d-orbital (b) s-orbital (c) p-orbital (d) None
- 27. Which of the following has greatest reducing power:**
 (a) HI (b) HBr (c) HCl (d) HI
- 28. Which of the following elements show only one oxidation state in its compounds:**
 (a) F (b) Cl (c) Br (d) I
- 29. Which halogen is most electropositive:**
 (a) F (b) Cl (c) Br (d) I
- 30. Fluorine is a stronger oxidizing agent than chlorine in aqueous solution. This is attributed to many factors except:**
 (a) Heat of dissociation (b) Electron affinity
 (c) Ionization potential (d) Heat of hydration
- 31. Bleaching powder reacts with a few drops of conc. HCl to give:**
 (a) Chlorine (b) Hypochlorous acid (c) Calcium oxide (d) Oxygen
- 32. The bleaching action of chlorine is due to:**
 (a) Reduction (b) Hydrogenation
 (c) Chlorination (d) Oxidation
- 33. Elements of which of the following groups will form anions most readily:**
 (a) Oxygen family (b) Nitrogen family
 (c) Halogens (d) Alkali metals
- 34. The halogen that is most easily reduced:**
 (a) F₂ (b) Cl₂ (c) Br₂ (d) I₂
- 35. Which of the following is most volatile:**
 (a) HI (b) HBr (c) HCl (d) HF
- 36. Sodium chloride when heated with conc. H₂SO₄ and solid potassium dichromate gives:**
 (a) Chromic chloride (b) Chromyl chloride
 (c) Chromous chloride (d) None of these
- 37. Which of the following is monoatomic gas:**
 (a) Oxygen (b) Neon
 (c) Fluorine (d) Nitrogen
- 38. Which of the following fluorides of xenon is impossible?**
 (a) XeF₂ (b) XeF₃ (c) XeF₄ (d) XeF₆
- 39. The following shows zero oxidation state:**
 (a) Kr (b) Be (c) Al (d) Na
- 40. Which of the following noble gas is not present in atmosphere:**
 (a) He (b) Ne (c) Ar (d) Rn
- 41. The noble gas which was discovered first on the Sun and then on the earth:**
 (a) Argon (b) Xenon (c) Neon (d) Helium

- 42. The last member of the family of inert gases is:**
 (a) Argon (b) Radon (c) Xenon (d) Neon
- 43. XeF₆ on partial hydrolysis produces:**
 (a) XeF₂ (b) XeOF₂ (c) XeOF₄ (d) XeO₃
- 44. Which of the following noble gases does not have an octet of electrons in its outermost shell:**
 (a) Neon (b) Radon (c) Argon (d) Helium
- 45. The value of ionization potential for inert gases is:**
 (a) Zero (b) Low (c) High (d) Negative
- 46. The lowest boiling point of helium is due to:**
 (a) Inertness
 (b) Gaseous nature
 (c) High polarizability
 (d) Weak Van-der Waal's forces between atoms
- 47. Which of the following statement is correct? (LHR 2014)**
 (a) Bond energy of F₂ is less than Cl₂ (b) Bond energy of F₂ is less than I₂
 (c) Bond energy of Cl₂ is less than F₂ (d) Bond energy of Cl₂ is less than Br₂
- 48. Goiter is caused due to the deficiency of:**
 (a) Flourine (b) Bromine (c) Chlorine (d) Iodine
- 49. Which hydrogen halide is the weakest acid in solution? (BWP 14, FSD, LHR 13, GRW 13,14)**
 (a) HF (b) HBr (c) HI (d) HCl
- 50. The compound which causes burn to skin that heals slowly: 11 (LHR 2011)**
 (a) F₂ (b) Cl₂ (c) Br₂ (d) Acid

ANSWER KEY

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

CHAPTER 6

TRANSITION ELEMENTS

- Coordination number of Fe in $[\text{Fe}(\text{CN})_6]^{-4}$ ion is:**
(GRW 2010)
(a) 4 (b) 2 (c) 6 (d) -4
- In $[\text{Co}(\text{NH}_3)_6]^{+3}$ the coordination number of cobalt is:**
(a) Zero (b) Two (c) Four (d) Six
- Which one of the following correctly explains the structure of $[\text{Cu}(\text{NH}_3)_4]^{+2}$:**
(a) Square planar (b) Tetrahedral (c) Octahedral (d) Linear
- Which one of the following compounds has oxidation state of chromium other than +6:**
(a) K_4CrO_4 (b) $\text{K}_2\text{Cr}_2\text{O}_4$ (c) Cr_2O_6 (d) CrCl_3
- In acidic medium, potassium dichromate acts as:**
(a) Oxidizing agent (b) Reducing agent (c) An Acid (d) A base
- Interstitial compounds are formed by:**
(a) Fe (b) Ni (c) Co (d) All
- Which element is always present with iron in steel:**
(a) Aluminium (b) Copper (c) Carbon (d) Nickel
- Which of the following transition elements show highest oxidation state:**
(a) Mn (b) Cr (c) Cr (d) Zn
- Following property of transition elements does not vary with a regular pattern:**
(LHR 2011)
(a) Binding energy (b) Covalent radius
(c) Melting point (d) Cationic radius
- The coordination number of transition element in $[\text{Co}(\text{NO}_2)_3(\text{NH}_3)_3]$ is:**
(a) 3 (b) 4 (c) 6 (d) 0
- Group IB of transition elements contains:**
(a) Zn, Cd, Hg (b) Cu, Au, Ag
(c) Fe, Ru, Os (d) Cr, Mo, W
- The strength of binding energy of transition elements depends upon: (LHR 13, GRW 13,14, SGD 11)**
(a) Number of electron pairs (b) Number of unpaired electrons
(c) Number of Neutrons (d) Number of protons
- First transition series starts with:**
(a) Y (b) Sc (c) Zn (d) Cd
- Group IIB of transition elements contains**
(a) Zn, Cd, Hg (b) Cu, Au, Ag
(c) Fe, Ru, Os (d) Cr, Mo, W
- The shape of ions containing dsp^3 hybridization is :**
(a) Tetrahedral (b) Trigonal bipyramidal
(c) Octahedral (d) Square planar
- Coordination number of iron in $\text{K}_3[\text{Fe}(\text{CN})_6]$ is:**
(a) 6 (b) 4 (c) 1 (d) 2
- The paramagnetic behavior is the strongest for**
(a) Fe and Mn (b) Fe^{3+} and Mn^{2+}
(c) Fe^{2+} and Mn^{3+} (d) Fe^{2+} and Mn^{2+}
- The ore of iron:**
(a) Fe_3O_4 (b) Fe_2O_2 (c) FeO (d) $\text{Fe}(\text{OH})_2$
- The Chemical formula of Slag is:**
(a) MnSiO (b) MnSiO_2 (c) MnSiO_3 (d) Mn_2SiO_2

20. Chromates are salts of:
 (a) HCrO_3 (b) H_2CrO_4 (c) HCr_2O_7 (d) H_2CrO_6
21. The color of all the chromates is:
 (a) White (b) Red (c) Blue (d) Yellow
22. Which of the following can also be prepared by Stadelers process:
 (a) H_2SO_4 (b) K_2SO_4 (c) KMnO_4 (d) H_2S
23. Medium carbon steel is used in making:
 (a) Castings (b) Hammer
 (c) Tubes (d) All of above
24. Which of following is a very powerful oxidant :
 (a) Sulphates (b) Dichromates
 (c) Nitrates (d) Chromates
25. Which of the following transition metal ions will have definite value of magnetic moment:
 (a) Sc^{3+} (b) Ti^{3+} (c) Cu^+ (d) Zn^{2+}
26. Which of the following metal exhibits more than one oxidation states:
 (a) Na (b) Mg (c) Fe (d) Al
27. The equilibrium $\text{Cr}_2\text{O}_7^{2-} \leftrightarrow 2\text{CrO}_4^{2-}$ is shifted to right in:
 (a) An acidic medium (b) A basic medium
 (c) A neutral medium (d) It does not exist
28. Bessemer converter is used in the manufacture of:
 (a) Pig iron (b) Steel
 (c) Wrought iron (d) Cast iron
29. The number of unpaired electrons in Ferrous ion ($Z = 26$) is
 (a) 1 (b) 2 (c) 4 (d) 5
30. Corrosion of iron can be prevented by coating the surface with:
 (a) Zn (b) Sn
 (c) Ni (d) Any of the above
31. Choose the correct answer about transition elements:
 (a) Transition elements have low melting points
 (b) Transition elements do not have catalytic activity
 (c) Transition elements exhibit variable oxidation states
 (d) Transition elements exhibit inert pair effect
32. The total number of inner transition elements in the periodic table is:
 (a) 10 (b) 14 (c) 28 (d) 30
33. The number of unpaired electrons in Mn^{2+} ($Z=25$) is:
 (a) 5 (b) 4 (c) 3 (d) 2
34. The number of unpaired electrons in Fe^{3+} ($Z = 26$) are
 (a) 5 (b) 6 (c) 3 (d) 4
35. In the manufacture of steel by open hearth process, the slag obtained is:
 (a) CaSiO_3 (b) FeSiO_3 (c) MnSiO_3 (d) All
36. Which of the following is not an element:
 (a) Graphite (b) Diamond
 (c) 22-Carat gold (d) Rhombic sulphur
37. How many moles of acidified FeSO_4 solution can be completely oxidized by one mole of KMnO_4 :
 (a) 10 (b) 5 (c) 6 (d) 2
38. An element in +3 oxidation state has the electronic configuration (Ar) $3d^3$. Its atomic number is:
 (a) 24 (b) 23 (c) 22 (d) 21
39. Which of the following has the maximum number of unpaired d-electrons?
 (a) Zn (b) Fe^{2+} (c) Ni^{3+} (d) Cu^+

40. **Group VI B of transition elements contains:**
 (a) Zn, Cd, Hg (b) Fe, Ru, Os
 (c) Cr, Mo, W (d) Mn, Tc, Re
41. **Formula of chromyl chloride is:** (RWP 08, SGD 12)
 (a) Cr_2OCl_2 (b) CrO_2Cl_2 (c) Cr_2OCl_3 (d) CrOCl_2
42. **The geometrical shape of PCl_5 is:** (RWP 2009)
 (a) Octahedral (b) Square planar
 (c) Tetrahedral (d) Trigonal bipyramidal
43. **Coinage metals are present in the periodic table in group:** (MTN 2008)
 (a) I-A (b) I-B (c) II-A (d) II-B
44. **PCl_5 has hybridization:** (MTN 2009)
 (a) sp (b) dsp^2 (c) sp^2 (d) dsp^3
45. **The chemical formula of hematite is:** (MTN 09, BWP 12)
 (a) Fe_2O_3 (b) Fe_3O_4
 (c) FeO (d) $\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$
46. **There are ____ types of ligands in $[\text{PtCl}(\text{NO}_2)(\text{NH}_3)_4]^{2-}$** (MTN 2010)
 (a) 2 (b) 3 (c) 6 (d) 7
47. **Which of the following elements is paramagnetic:** (BWP 2010)
 (a) Zinc (b) Iron (c) Scandium (d) Copper
48. **The purest form of iron is:** (BWP 2011)
 (a) Wrought iron (b) Pig iron (c) Cast iron (d) Steel
49. **The central metal atom along with ligand is called:** (DGK 2008)
 (a) Coordination number (b) Coordination sphere
 (c) Chelates (d) none of these
50. **Mild steel contains carbon:** (LHR 2012)
 (a) 0.1 to 0.2% (b) 0.2 to 0.7%
 (c) 0.2 to 0.6% (d) 0.1 to 0.6%
51. **Percentage of carbon in steel is:** (RWP 2012)
 (a) 0.25 to 2.5% (b) 0.12 to 0.20%
 (c) 3.0 to 4.5% (d) 2.0 to 4.5%
52. **Which of the following species has the maximum number of unpaired electrons?** (SGD, GRW 2015)
 (a) O_2 (b) O_2^+ (c) O_2^- (d) O_2^{2-}
53. **Which of the following species has the maximum number of unpaired electrons?** (DGK, BWP 2014)
 (a) Fe (b) Fe^{+2} (c) Mn^{+2} (d) Cr^{+3}
54. **Coordination number of Cu in $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4$ is:** (LHR 2014)
 (a) Zero (b) Two (c) Four (d) Six

ANSWER KEY

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
c	d	a	b	a	d	c	a	d	c
11	12	13	14	15	16	17	18	19	20
b	b	b	a	b	a	b	a	c	b
21	22	23	24	25	26	27	28	29	30
d	c	a	b	b	c	b	b	c	d
31	32	33	34	35	36	37	38	39	40
c	c	a	a	d	d	b	a	b	c
41	42	43	44	45	46	47	48	48	50
b	c	b	d	a	a	b	a	b	a
51	52	53	54						
a	a	c	c						

CHAPTER 7

FUNDAMENTAL PRICIPLES OF ORGANIC CHEMISTRY

- The total coal resources of Pakistan estimated by geological survey are:**
(a) 184 billion tonnes (b) 184 million tonnes
(c) 841 billion tonnes (d) 184 tonnes
- How many isomers are possible for C_6H_{14} :**
(a) 4 (b) 5 (c) 6 (d) 7
- Which one of the following is an isomer of Dimethyl ether:**
(a) $(CH_3)_2CHOH$ (b) CH_3CH_2OH (c) $CHO-CHO$ (d) None
- The hardest form of coal is:**
(a) Bituminous (b) Sub-bituminous coal (c) Anthracite (d) Lignite
- Which one of the following compounds is heterocyclic?**
(a) Anthracene (b) Phenol (c) Pyridine (d) Aniline
- Which molecule has a tetrahedral shape?**
(a) CH_3-CH_3 (b) $CH_2=CH_2$ (c) CH_2CH_3 (d) None
- The formula of aniline is:**
(a) C_6H_5 (b) $C_6H_5-NH-C_6H_5$
(c) $C_6H_5-NH_2$ (d) $C_6H_5-NO_2$
- The formula of cyclopropane is:**
(a) C_3H_8 (b) C_3H_4 (c) C_3H_5 (d) C_3H_6
- The Octane number is 100 for:**
(a) n-Octane (b) n-Heptane
(c) Iso-Octane (d) n-Hexane
- Homologues of alkanes differ from each other by:**
(a) CH_2 group (b) CH_3 group
(c) CH_4 group (d) CH group
- The major components of coal gas are:**
(a) H_2 and CH_4 (b) Ethane and CO
(c) H_2 and CO (d) H_2 , CH_4 and CO
- The compound in which two alkyl groups are attached to carbonyl group is called:**
(a) Ether (b) Alcohol
(c) Ketone (d) Aldehyde
- Carbonyl group is present in:**
(a) Aldehyde (b) Ketone
(c) Alcohols (d) both a and b
- The Chemical formula of urea is:**
(a) $(NH_4)_2CO$ (b) $(NH_2)_4C$
(c) $(NH_2)_2CO$ (d) $(NH_4)_2CO_3$
- The fractional distillation of petroleum yields only:**
(a) 20% Gasoline (b) 30% Gasoline
(c) 15% Gasoline (d) 10% Gasoline
- Antiknocking agent is:**
(a) $(C_2H_5)_2Pb$ (b) $(C_2H_5)_4Pb$
(c) $(C_2H_5)_3Pb$ (d) $(C_2H_5)_4Pd$
- Father of Organic Chemistry is:**
(a) Faraday (b) Hoffman
(c) F. Wohler (d) Democritus

- 18. The example of sp hybridization is:**
 (a) Methane (b) Benzene (c) Ethene (d) Ethyne
- 19. The number of chain isomers of Pentane are:**
 (a) Three (b) Two (c) One (d) Zero
- 20. Metamerism is only shown by:**
 (a) Ethers (b) Ketones
 (c) Both a and b (d) every organic family
- 21. Octane number 100 is given to:**
 (a) n – octane (b) n – Heptane
 (c) 2,2,4 – Trimethylpentane (Iso-octane) (d) 2,2,4 – Trimethyl octane
- 22. The type of hybridization of carbon atom in methane is:**
 (a) sp (b) sp²
 (c) sp³ (d) None of these
- 23. The boiling point range of petroleum ether is:** (GRW 2007)
 (a) 5 – 20°C (b) 10 – 30°C
 (c) 20 – 60°C (d) 30 – 90°C
- 24. Which one of the following is not a heterocyclic compound?** (LHR 2008)
 (a) Thiophene (b) Anthracene (c) Furan (d) Pyrrol
- 25. The state of hybridization of carbon atom in ethane is:** (GRW 2008,12)
 (a) sp³ (b) sp² (c) sp (d) dsp²
- 26. Geometric isomerism is present in:** (GRW 2010)
 (a) Methane (b) Ethane
 (c) Propane (d) 2-Butene
- 27. Double bond consists of:**
 (a) Two sigma bonds (b) One sigma one pi bond
 (c) One sigma and two pi bonds (d) Two pi bonds
- 28. Which set of hybrid orbitals has planar triangular shape?**
 (a) sp³ (b) sp (c) sp² (d) dsp²
- 29. The type of hybridization of carbon atom in methane is:** (LHR 2007,09)
 (a) sp³ (b) sp (c) sp² (d) dsp²
- 30. The chemist who synthesized urea from ammonium cyanate was:** (FSD 2014)
 (a) G.N. Lewis (b) Fredrick Wohler
 (c) Kolbe (d) Berzelius
- 31. The process used to improve the quality of gasoline is called:** (LHR 2014)
 (a) Thermal cracking (b) Reforming
 (c) Steam cracking (d) Combustion
- 32. An isomer of C₂H₅OH is:** (SGD, GRW 2015)
 (a) CH₃OH (b) (C₂H₅)₂O
 (c) CH₃OCH₃ (d) CH₃COCH₃
- 33. Linear shape is associated with which set of hybrid orbitals?** (MTN 08,13, SGD, FSD 09, GRW, BWP 09,15)
 (a) sp³ (b) sp (c) sp² (d) dsp²
- 34. Ethers show the phenomena of:** (SGD 14, LHR 14,15, FSD 11)
 (a) Metamerism (b) Functional group isomerism
 (c) Position isomerism (d) cis-trans isomerism
- 35. Carbon atom in following is sp² hybridized** (LHR 2011)
 (a) CH₃CN (b) CHECH (c) HCOOH (d) CH₂Cl₂
- 36. The isomerism shown by alkanes is:** (LHR 2011)
 (a) Skeletal (b) Position
 (c) Geometric (d) Metamerism
- 37. Hybridization of carbon in carbonyl group is:** (FSD, SGD 15, RWP 10)
 (a) sp³ (b) sp (c) sp² (d) dsp²

38. **How many isomers are there in pentane?** (FSD 09, LHR 12, GRW 11)
 (a) 6 (b) 5 (c) 3 (d) 2
39. **Vital force theory was rejected by:** (LHR 2012,14)
 (a) G.N. Lewis (b) F. Wholer
 (c) Greek Philosophers (d) Scientists of 20th century
40. **Select one which shows cis-trans isomerism.** (FSD 2010)
 (a) $\text{Cl}_2\text{C}=\text{CCl}_2$ (b) $\text{CH}_2=\text{CH}_2$
 (c) $\text{ClCH}=\text{CHCl}$ (d) $\text{Br}_2\text{C}=\text{CBr}_2$
41. **Which of the following compound may exist as cis-trans isomer?**
 (a) 1-butene (b) 2-butene (c) Cyclopropane (d) Acetone
42. **Urea belongs to which class of compounds?** (RWP 2009)
 (a) Imides (b) Amines
 (c) Amides (d) carboxylic acid
43. **In ethane, each carbon atom is:** (GRW, FSD 12, LHR 10, DGK 09)
 (a) sp^3 hybridized (b) sp^2 hybridized
 (c) sp hybridized (d) unhybridized
44. **The hybridization of carbon atom in HCHO is:** (MTN, RWP 2011)
 (a) sp (b) sp^2 (c) sp^3 (d) dsp
45. **Geometric isomerism in alkenes is due to:** (MTN 2008)
 (a) Oscillation of H atoms between two polyvalent carbon atoms
 (b) Optical rotation due to multiple bonds
 (c) Free rotation about C=C bond
 (d) Restricted rotation about C=C bond
46. **Metamerism is shown by:**
 (a) Amines (b) Ethers
 (c) neither a nor b (d) Both a and b
47. **Dimethyl ether and Ethyl alcohol are called:** (MTN 2009)
 (a) Metamers (b) Functional group isomers
 (c) Position isomers (d) cis-trans isomers
48. **The self-linking property of elements is:** (MTN 2009)
 (a) Aromatization (b) Polymerization (c) Association
 (d) Catenation
49. **The carbon atoms in propene are:** (MTN 2010)
 (a) sp (b) sp^2
 (c) sp^3 and sp^2 (d) sp^2 and sp
50. **Peat before conversion into coal is converted into:** (BWP 2008)
 (a) Anthracite (b) Asphalt
 (c) Lignite (d) all of these
51. **Tetra methyl lead is added to petrol to:** (BWP 2010)
 (a) Prevent its freezing point (b) Increase its boiling point
 (c) Prevent knocking (d) Increase its viscosity
52. **The crude petroleum is separated in fractions by:** (DGK 2008)
 (a) Filtration (b) Fractional distillation
 (c) Steam distillation (d) Fractions sublimation
53. **Carbon atom in Dimethyl ether is:** (DGK 2009)
 (a) sp^3 hybridized (b) sp^2 hybridized
 (c) sp hybridized (d) unhybridized
54. **Number of isomers of C_4H_{10} is:** (DGK 2010)
 (a) 1 (b) 2 (c) 3 (d) 4
55. **In t-butyl alcohol, the tertiary carbon is bonded to:** (MTN, SGD 2015)
 (a) Three hydrogen atoms (b) Two hydrogen atoms
 (c) One hydrogen atom (d) No hydrogen atom

ANSWER KEY

1.	2.	3.	4.	5.	6.	7.	8.	9.	10
a	a	b	c	c	a	c	d	c	a
11	12	13	14	15	16	17	18	19	20
d	c	d	c	a	b	c	d	a	c
21	22	23	24	25	26	27	28	29	30
c	c	c	b	a	d	b	c	a	b
31	32	33	34	35	36	37	38	39	40
b	c	b	a	c	a	b	3	b	c
41	42	43	44	45	46	47	48	49	50
b	c	a	b	d	b	b	d	c	c
51	52	53	54	55					
c	b	b	b	d					

CHAPTER 8

ALIPHATIC HYDROCARBONS

- An Aldehyde is reduced to Alkane with:**
(a) $\text{KOH} + \text{N}_2\text{H}_4$ (b) NaOH
(c) CaO and NaOH (d) Co(OH)_2
- Which of the following compound will not form Metal alkynide:**
(a) Ethyne (b) Propyne
(c) 1- Butyne (d) 2-Butyne
- When a mixture of Ethene and air is passed over heated silver under pressure we get:**
(a) Superoxide (b) Epoxide
(c) Ozonide (d) Benzene
- Ethyl chloride when boiled with alcoholic KOH gives:**
(a) Acetylene (b) Ethylene
(c) Ether (d) Ethyl alcohol
- What type of reaction occurs between Ethene and hydrogen:**
(a) Addition (b) Substitution
(c) Oxidation (d) Dehydration
- Which ion is most stable:**
(a) CH_3^+ (b) $\text{CH}_3\text{-CH}_2^+$
(c) $(\text{CH}_3)_2\text{CH}^+$ (d) $(\text{CH}_3)_3\text{C}^+$
- Mustard gas is:**
(a) Highly viscous liquid (b) Low boiling liquid
(c) High boiling liquid (d) Colourless gas
- Select the compound which has acidic hydrogen:**
(a) Methane (b) Ethene
(c) Butadiene (d) Acetylene
- The characteristic reactions of alkanes are:**
(a) Polymerization (b) Addition
(c) Elimination (d) Substitution
- Polymerization of three molecules of acetylene while passing through Cu tube at 300°C gives:**
(a) Benzene (b) n-Hexane
(c) Naphthalene (d) Cyclohexane
- The characteristic reactions of alkenes are:**
(a) Polymerization (b) Addition
(c) Elimination (d) Substitution
- The presence of pi bond in a molecule is the sign of :**
(a) Unsaturation (b) Inertness
(c) Stability (d) Saturation
- Vinyl acetylene combines with HCl to yield:**
(a) Neoprene rubber (b) Chloroprene
(c) Poly vinyl acetylene (d) White ppt.
- CH_3 is an example of:**
(a) Alkenyl group (b) Alkane series
(c) Alkyl group (d) None of these
- When Sodium Salts of fatty acid are heated with Sodalime, we get alkane along with:**
(a) Na_4C (b) H_2O
(c) $\text{CO}_2 + \text{N}_2$ (d) Na_2CO_3

- 16. For each double bond, the heat of hydrogenation of Alkene is:**
 (a) 110 K.J mol⁻¹ (b) 130 K.J mol⁻¹
 (c) 115 K.J mol⁻¹ (d) 120 K.J mol⁻¹
- 17. The alkenes react with aqueous solution of halogen acid to form:**
 (a) Alcohols (b) Aldehyde
 (c) Alkanes (d) Alky halides
- 18. Which of following is used as a general anesthetic:**
 (a) Ethane (b) Propane
 (c) Ethenol (d) Ethene
- 19. Alkyl halides on treatment with active metals like Zn yield:**
 (a) Alkene (b) Alkyne
 (c) Alkane (d) Alcohol
- 20. Which of following is prepared by oxidation of Ethane:**
 (a) Acetone (b) Ethyl alcohol
 (c) Formic acid (d) None
- 21. Acetylene gives:**
 (a) White ppt. with ammonical AgNO₃ and red ppt. with ammonical Cu(NO₃)₂
 (b) With ppt. with ammonical AgNO₃ and red ppt. with ammonical Cu₂Cl₂
 (c) White. ppt. with both
 (d) Red ppt. with both
- 22. The order of reactivity of halogens in aliphatic substitution reactions:**
 (a) Br₂ > Cl₂ > F₂ (b) Cl₂ > Br₂ > F₂
 (c) F₂ > Cl₂ > Br₂ (d) F₂ > Br₂ > Cl₂
- 23. The IUPAC name of the compound having the formula (CH₃)₃C – CH = CH₂ is:**
 (a) 1, 1 – Dimethyl-3-butene (b) 1, 1, 1 – Trimethyl-3 propene
 (c) 3, 3 – Dimethyl-1-butene (d) 3, 3,3 – Trimethyl-1-propene
- 24. For preparing a symmetrical alkane, a concentrated aqueous solution of sodium or potassium salt of saturated carboxylic acid is subjected to:**
 (a) Hydrolysis (b) Oxidation
 (c) Hydrogenation (d) Electrolysis
- 25. The reaction/method that does not give an alkane is**
 (a) Catalytic hydrogenation of Alkene (b) Wurtz reaction
 (c) Hydrolysis of alkyl magnesium bromide (d) Dehydrohalogenation of an alkyl halide
- 26. A fuel has the same knocking property as a mixture of 70% Iso-octane (2, 2, 4-Trimethylpentane) and 30% n-Heptane by volume, the octane number of that fuel is:**
 (a) 100 (b) 70
 (c) 50 (d) 40
- 27. Hydrocarbon which is liquid at room temperature is:**
 (a) Hexane (b) Butane
 (c) Ethane (d) Propane
- 28. Marsh gas was the name given to:**
 (a) Methane (b) Ethane
 (c) Propane (d) Butane
- 29. Each different compound should have a different name" was published by IUPAC system of nomenclature in:**
 (a) 1892 (b) 1830
 (c) 1947 (d) 1979
- 30. Write the name of following Alkene CH₂ = CH- CH = CH₂**
 (a) 1, 3-Butadiene (b) Buta -1 , 3 diene
 (c) Both a & b (d) None
- 31. C_nH_{2n} is the general formula of:**
 (a) Alkanes (b) Alkenes
 (c) Alkynes (d) None of above

- 32. An Alkane is produced when an Alkyl halide reacts with Zinc in the presence of a catalyst; the reaction is called:**
 (a) Sabatier-Sendern's reaction (b) Wurtz Synthesis
 (c) Frankland's Reaction (d) Clemmenson's reduction
- 33. The method in which alkane is prepared by Alkyl halide in the presence of Palladium charcoal, is:**
 (a) Hydrolysis (b) Electrolysis
 (c) Hydrogenation (d) Hydrogenolysis
- 34. Kolbe's method is not useful for the production of:**
 (a) Methane (b) Ethane
 (c) Butane (d) Hexane
- 35. Kolbe's method has limited synthetic applications due to:**
 (a) Use of electrical energy (b) Slow reaction
 (c) Number of side products (d) Salts used are very expensive
- 36. The reaction in which a Ketone is reduced to the alkane is called:**
 (a) Kolbe's electrolysis (b) Clemmensen's reduction
 (c) Cannizzaro (d) None
- 37. Alkanes containing carbons C-18 onwards are:**
 (a) Gases (b) Liquids
 (c) Waxy solids (d) Solids
- 38. Alkanes are soluble in all except:**
 (a) Benzene (b) Ether
 (c) Water (d) Carbon tetra chloride
- 39. The property of an alkane which does not increase with increase in molar mass:**
 (a) Boiling point (b) Melting point
 (c) Density (d) Solubility
- 40. The low reactivity of alkanes is based upon:**
 (a) Inertness of sigma-bond (b) Non-polarity of the bonds
 (c) Both a and b (d) None of above
- 41. Complete combustion of alkane yields:**
 (a) $\text{CO}_2 + \text{H}_2\text{O}$ (b) $\text{CO}_2 + \text{Heat}$
 (c) $\text{CO}_2 + \text{H}_2\text{O} + \text{CO}$ (d) $\text{CO}_2 + \text{H}_2\text{O} + \text{Heat}$
- 42. The major reaction occurring in the engines of automobiles is:**
 (a) Oxidation (b) Reduction
 (c) Combustion (d) Decomposition
- 43. Incomplete oxidation of alkanes yields:**
 (a) CO_2 & carbon black (b) $\text{CO}_2 + \text{CO}$
 (c) $\text{CO} + \text{H}_2\text{O} + \text{carbon black}$ (d) $\text{CO}_2 + \text{heat}$
- 44. The order of reactivity of halogen acids towards alkenes:**
 (a) $\text{HCl} > \text{HBr} > \text{HI}$ (b) $\text{HBr} > \text{HCl} > \text{HI}$
 (c) $\text{HCl} > \text{HBr} > \text{HF}$ (d) $\text{HI} > \text{HBr} > \text{HCl}$
- 45. Raney – Nickel is the alloy of Ni with:**
 (a) Pt (b) Al
 (c) Cu (d) Pd
- 46. Polymerization of Ethene to Polyethylene take place at pressure of 100 atm and a temperature of:**
 (a) 200°C (b) 400°C
 (c) 600°C (d) 800°C

- 47. During the preparation of alkynes the active metals that reacts with Tetrahalo-alkane is:**
 (a) Zn (b) Mg
 (c) Both a and b (d) None
- 48. Alkynes are colorless & odorless except:**
 (a) Acetylene (b) Propyne
 (c) Butyne (d) Pentyne
- 49. An Alkyne having Carbon atoms =15 is most probably a:**
 (a) Gas (b) Liquid
 (c) Solid (d) Waxy solid
- 50. The reaction of Acetylene with water in H_2SO_4 and $HgSO_4$ yields:**
 (a) Vinyl alcohol (b) Acetaldehyde
 (c) Mixture of both a and b (d) None
- 51. The gas used for illumination:**
 (a) Methane (b) Ethene
 (c) Ethyne (d) None
- 52. The Alkynides are used for the -----of alkynes**
 (a) Preparation (b) Purification
 (c) Separation (d) All of above
- 53. Formula of chloroform is:**
 (a) CH_3Cl (b) CH_2Cl_2
 (c) $CHCl_3$ (d) CCl_4

ANSWER KEY

1.	2.	3.	4.	5.	6.	7.	8.	9.	10
a	d	b	b	a	d	c	d	d	a
11	12	13	14	15	16	17	18	19	20
b	a	b	c	d	d	d	d	c	b
21	22	23	24	25	26	27	28	29	30
b	c	c	d	d	b	a	a	c	c
31	32	33	34	35	36	37	38	39	40
b	c	d	a	c	b	c	c	d	c
41	42	43	44	45	46	47	48	49	50
d	c	c	d	b	b	c	a	c	c
51	52	53							
a	d	c							

CHAPTER 9

AROMATIC HYDROCARONS

- Most common reactions of benzene and its derivatives are:**
(a) Electrophilic addition reactions (b) Electrophilic substitution reactions
(c) Nucleophilic addition reactions (d) Nucleophilic substitution reactions
- Benzene + Ozone \rightarrow Y, in this sequence Y is:**
(a) Benzene monoozonide (b) Benzene diozonide
(c) Benzene triozone (d) Succinic acid
- Which species represents the electrophile in aromatic Nitration:**
(a) NO_2 (b) NO_2^+ (c) NO^+ (d) NO_3
- Heating a mixture of Sodium benzoate and soda lime gives:**
(a) Benzene (b) Methane
(c) Sodium benzoate (d) Calcium benzoate
- Which of the following species participate in Sulphonation of benzene ring:**
(a) SO_3^{-2} (b) $\text{S}_2\text{O}_3^{-2}$ (c) SO_3 (d) SO_2
- The compound prepared by electrophilic substitution reaction of benzene is:**
(a) Acetophenone (b) Glyoxal
(c) Cyclohexane (d) Hexabromo cyclohexane
- The term 'Aromatic' was derived from:**
(a) Greek word (b) Latin (c) Russian (d) English
- Which compound was recognized as the parent member of aromatic compounds:**
(a) Aniline (b) Phenol (c) Benzene (d) Toluene
- Which one of the following is not monocyclic aromatic hydrocarbon:**
(a) Benzaldehyde (b) Benzoic acid
(c) Benzene sulphonic acid (d) Anthracene
- In which one of the following compound rings are not fused together at ortho positions:**
(a) Phenanthrene (b) Naphthalene
(c) Diphenylmethane (d) Anthracene
- Toluene is called:**
(a) Hydroxyl benzene (b) Methyl benzene (c) Ethyl benzene (d) None
- Substituted phenyl groups are called:**
(a) Aryl groups (b) Phenyl groups
(c) Acyl groups (d) Alkyl groups
- Benzene was discovered by Michael Faraday's in:**
(a) 1824 (b) 1825 (c) 1826 (d) 1827
- The empirical formula of Benzene was determined by:**
(a) IR spectra (b) U.V
(c) Elemental analysis (d) NMR spectra
- How many molecules of chlorine add to benzene in the presence of sunlight:**
(a) One (b) Two (c) Three (d) Four
- The bond angles in benzene ring are:**
(a) 90° (b) 120° (c) 145° (d) None
- All C-H bond lengths of benzene ring is:**
(a) 1.07\AA (b) 1.09\AA (c) 1.08\AA (d) None
- A six membered ring containing one double bond is called:**
(a) Cyclohexene (b) Cyclohexane (c) Benzene (d) None
- Hybridization of each carbon atom in benzene ring is:**
(a) sp (b) sp^2 (c) sp^3 (d) dsp^2

20. The stability of aromatic compounds _____ with the increase in the number of its resonance structures:
 (a) Decreases (b) Increases
 (c) Remains constant (d) partially decreases
21. Benzene is obtained from Benzene sulphonic acid by treating it with:
 (a) HCl (b) NaOH (c) H₂O (d) NaHCO₃
22. Which Electrophilic substitution reaction is too vigorous to control:
 (a) Chlorination (b) Bromination
 (c) Iodination (d) Fluorination
23. Sulphuric acid generates nitronium ion by reacting it with:
 (a) Nitric acid (b) Nitrogen gas
 (c) Nitrous acid (d) Potassium nitrate
24. Benzene reacts with ozone and gives:
 (a) Glycerin (b) Glyoxal
 (c) Maleic anhydride (d) Benzoic acid
25. Alkyl benzene are readily oxidized by acidified:
 (a) KMnO₄ (b) K₂CO₃ (c) MnO₂ (d) Mn
26. The electron releasing effect of Methyl group is significant and it makes the ring a good:
 (a) Electrophilic (b) Nucleophilic
 (c) Nucleophobic (d) Hydrophobic
27. Meta directing groups decrease the ----- of benzene ring:
 (a) Melting point (b) Chemical reactivity (c) Density (d) None
28. Which class of compound is most reactive:
 (a) Alkane (b) Alkene
 (c) Alkyne (d) Benzene
29. Which of the following acid can be used as a catalyst in Friedel Craft's reactions:
 (a) AlCl₃ (b) HNO₃ (c) BeCl₂ (d) NaCl
30. Aromatic hydrocarbons are the derivatives of:
 (a) Normal series of paraffin (b) Alkenes (c) Benzene (d) None
31. Which one of the following is (m-xylene):
 (a) 1,2-Dimethyl benzene (b) 1,3-Dimethyl benzene
 (c) 1,5-Dimethyl benzene (d) 1,4-Dimethyl benzene
32. The Nitration of benzene takes place when it is heated with a mixture of conc. HNO₃ and conc. H₂SO₄ at 50°C in ratio of :
 (a) 1 : 2 (b) 1 : 1 (c) 1 : 3 (d) 2 : 1
33. The three alternate single and double bonds in the benzene ring are called:
 (a) Conjugate bonds (b) Resonating bonds
 (c) Both a and b (d) None of above
34. The difference between amount of heat actually released and the experimentally calculated heat is called:
 (a) Bond energy (b) Resonance energy
 (c) Binding energy (d) None
35. All are ortho & Para directing groups except:
 (a) -X (b) -OH (c) -NR₃ (d) -NH₂
36. Substitution of halogens in the benzene ring requires which catalyst?
 (a) NaCl (b) FeCl₃
 (c) SiO₂ (d) Organo - nickel
37. Which one of the following does not decolorize KMnO₄?
 (a) Alkene (b) Alkyne (c) Benzene (d) All
38. Benzene is prepared from n-Hexane in the presence of which catalyst?
 (a) Cr₂O₃ (b) Al₂O₃
 (c) SiO₂ (d) Fused mixture of a, b and c

39. **Benzene cannot undergo:**
 (a) Substitution reactions (b) Additional reaction
 (c) Oxidation reaction (d) Elimination reaction
40. **Ortho, para derivatives are obtained by halogenations of:** (LHR 2011)
 (a) Nitrobenzene (b) Toluene
 (c) Benzaldehyde (d) Benzene
41. **Benzene is prepared from Cyclohexane by the process called:** (LHR 2008)
 (a) Hydrogenation (b) Dehydration
 (c) Dehydrogenation (d) None of these
42. **The conversion of n-Hexane into benzene by heating in the presence of Pt is called:**
 (a) Isomerism (b) Aromatization
 (c) Dealkylation (d) Rearrangement
43. **Which compound is the most reactive one?**
 (a) Benzene (b) Ethene (c) Ethane (d) Ethyne
44. **What is the molecular formula of TNT?**
 (a) $C_6H_2(NO_2)_3CH_3$ (b) $C_6H_2(NO_2)_3CH_3$
 (c) $C_6H_2(NO_2)_3C_2H_5$ (d) $C_6H_2(NO_2)_3C_3H_7$
45. **Molecule of benzene contain** (GRW 2011,14)
 (a) Three double bonds (b) Two double bonds
 (c) One double bond (d) Delocalized π -electron charge
46. **Nitration of Toluene takes place at:**
 (a) m-position (b) p-position
 (c) o-position (d) both 'o' and 'p' positions
47. **Resonance energy of benzene is:** (LHR 2012)
 (a) 150.5 KJ/mol (b) 140.5 KJ/mol
 (c) 155 KJ/mol (d) 145 KJ/mol
48. **In which compound benzene rings are isolated?**
 (a) Diphenyl methane (b) Naphthalene
 (c) Anthracene (d) Phenanthrene
49. **Presence of double or triple bond is a sign of:** (SGD 2011)
 (a) Un-saturation (b) Saturation
 (c) Addition (d) Substitution
50. **Benzene reacts with alkyl and acyl halides in the presence of $AlCl_3$. This reaction is:** (RWP 2008)
 (a) Freidel Crafts reaction (b) Aldol condensation
 (c) Halogenations reaction (d) Nitration reaction

ANSWER KEY

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

CHAPTER 10

ALKYL HALIDES

- Electrophile amongst the following is:**
(a) NH_3 (b) H_2O (c) BF_3 (d) Cl_2
- $\text{S}_{\text{N}}2$ mechanism involves:**
(a) 1st order kinetics (b) 2nd order kinetics
(c) 3rd order kinetics (d) Zero order kinetics
- Alkyl magnesium halide (Grignard's reagent) when hydrolyzed yields:**
(a) Alkane (b) Alkene (c) Alkyne (d) Alkyl halide
- Tertiary alcohols are obtained by treating Grignard's reagent with:**
(a) Aldehyde (b) Ketone (c) Water (d) Amine
- Alkyl Halides are:**
(a) Monohaloalkanes (b) Dihaloalkanes (c) Polyhaloalkanes (d) All
- Which substance is used to convert Grignard's reagent to alkane:**
(a) H_2O (b) NH_3 (c) Ethyl alcohol (d) All of these
- For the reaction $\text{C}_2\text{H}_5\text{OH} + \text{HX} \rightarrow \text{C}_2\text{H}_5\text{-X} + \text{H}_2\text{O}$ the order of reactivity of HX is:**
(a) $\text{HBr} > \text{HI} > \text{HCl}$ (b) $\text{HI} > \text{HCl} > \text{HBr}$
(c) $\text{HCl} > \text{HBr} > \text{HI}$ (d) $\text{HI} > \text{HBr} > \text{HCl}$
- Carbanions are:**
(a) Electrophiles (b) Nucleophiles (c) Group of atoms (d) Free radical
- Secondary alkyl halides follow**
(a) First order kinetics (b) Second order kinetics
(c) Both a and b (d) none of these
- $(\text{CH}_3)_3\text{CBr}$ preferably undergoes:**
(a) $\text{S}_{\text{N}}2$ reactions (b) $\text{S}_{\text{N}}1$ reactions
(c) both a and b (d) none of these
- Ethyl chloride reacts with alcoholic KOH to give:**
(a) C_2H_4 (b) $\text{C}_2\text{H}_5\text{OH}$ (c) C_2H_6 (d) None of these
- When an alcohol reacts with SOCl_2 an alkyl halide is formed what are two other products:**
(a) SO_2 and HCl (b) SO_2 and H_2O
(c) HCl and H_2O (d) H_2S and HCl
- Which of the following is not a nucleophile:**
(a) OH^- (b) NH_3 (c) $\text{C}_2\text{H}_5\text{O}^-$ (d) Br^+
- Which of the following reactions is not shown by an alkyl halide:**
(a) $\text{S}_{\text{N}}1$ (b) $\text{S}_{\text{N}}2$ (c) Addition (d) Elimination
- In primary alkyl halides, the halogen atom is attached to a carbon which is further attached to:**
(a) One Carbon atoms (b) Two Carbon atoms
(c) Three Carbon atoms (d) Four Carbon atoms
- Reaction of following with Grignard's reagent can give primary alcohol: (LHR 2011,14)**
(a) Epoxide (b) Peroxide (c) Super oxide (d) Hydrogen

17. **S_N1 reactions are easily given by:** (LHR 2012)
 (a) Primary alkyl halide (b) Secondary alkyl halide
 (c) Secondary alcohols (d) Tertiary alkyl halides
18. **Thionyl chloride reacts with alcohol to form:**
 (a) Mustard gas (b) Alkyl halide (c) Aldehyde (d) Alcohol
19. **Which of the following is a Sodium Lead alloy:**
 (a) NaPb (b) Na₂Pb (c) Na₃Pb (d) Na₄Pb
20. **Secondary alcohol is formed when Grignard's reagent reacts with:**
 (a) Propanone (b) Methanal
 (c) Ethanal (d) Ethanoic acid
21. **When Grignard reagent reacts with Epoxide, it forms:**
 (a) 1- Alkanal (b) 1- Alkanol (c) Carboxylic acid (d) None
22. **Which of the following reagent cannot be used for preparing alkyl chloride from alcohol:**
 (a) HCl+ anhydrous ZnCl₂ (b) NaCl (c) PCl₅ (d) SOCl₂
23. **Carbon atom holding halogen in Alkyl halide is:**
 (a) sp²- hybridized (b) sp³-hybridized
 (c) sp-hybridized (d) sp³d- hybridized
24. **Which of the following does not give Iodoform test:**
 (a) Ethanol (b) Ethanal
 (c) Acetophenone (d) Benzophenone
25. **C-X bond is strongest in:**
 (a) CH₃Cl (b) CH₃Br (c) CH₃F (d) CH₃I
26. **The alkyl halide is converted into an alcohol directly by:**
 (a) Addition (b) Substitution
 (c) Dehydrohalogenation (d) Elimination
27. **Iodoethane reacts with sodium in ether, the product formed is:**
 (a) Ethane (b) Ethene (c) Butene (d) Butane
28. **1, 3 – Dibromopropane reacts with metallic zinc to form:**
 (a) Propene (b) Propane (c) Cyclopropane (d) Hexane
29. **Ethyl alcohol gives Ethyl chloride with the help of:**
 (a) SOCl₂ (b) NaCl (c) Cl₂ (d) KCl
30. **Butane nitrile is formed by reaction of KCN with:**
 (a) Propyl alcohol (b) Butyl chloride (c) Butyl alcohol (d) Propyl Chloride
31. **Tetrabromoethane on treatment with alcoholic zinc gives:**
 (a) Ethyl bromide (b) Ethane (c) Ethene (d) Ethyne
32. **S_N1 reaction of Alkyl halides leads to:**
 (a) Retention of configuration (b) Inversion of configuration
 (c) Both a and b (d) None of these
33. **Which one of the following will have the maximum dipole moment:**
 (a) CH₃F (b) CH₃Cl (c) CH₃Br (d) CH₃I
34. **The reaction of an Alkyl halide with RCOOAg produces:**
 (a) Ester (b) Ether
 (c) Aldehyde (d) Carboxylic acid
35. **The order of a typical S_N2 reaction is:** (FSD 2012)
 (a) Primary alkyl halide (b) Secondary alkyl halide
 (c) Secondary alcohols (d) Tertiary alkyl halides
36. **Most reactive Alkyl halide towards S_N1 reaction is:**
 (a) n-Butyl chloride (b) Sec-Butyl chloride
 (c) ter-Butyl chloride (d) Allyl chloride
37. **Which responds +vely towards Iodoform test:**
 (a) 1-Butene (b) Butanal
 (c) Acetic acid (d) 2-Pentanone

38. **Electrophile among the following is:**
 (a) NH_3 (b) H_2O (c) BF_3 (d) Cl_2
39. **The order of a typical $\text{S}_\text{N}2$ reaction is:**
(FSD 2010)
 (a) Zero (b) First (c) Second (d) Third
40. **Which of the following is not a Nucleophile?**
 (a) H_2O (b) H_2S (c) BF_3 (d) NH_3
41. **In which two mechanisms, the first step involved is same:**
 (a) E_1 and E_2 (b) E_2 and $\text{S}_\text{N}2$
 (c) E_1 and $\text{S}_\text{N}1$ (d) $\text{S}_\text{N}1$ and $\text{S}_\text{N}2$
42. **$\text{S}_\text{N}2$ reactions are:**
 (a) Unimolecular (b) Bimolecular
 (c) Trimolecular (d) Tetramolecular
43. **Elimination bimolecular reaction involves kinetics:** **(LHR 2014)**
 (a) 1st order (b) 2nd order
 (c) 3rd order (d) Zero order
44. **In primary alkyl halides, the halogen atom attached to a carbon atom is further attached to how many carbon atoms:**
 (a) Two (b) Three
 (c) One (d) Four
45. **Elimination bimolecular reaction involves:**
 (a) First order kinetics (b) Second order kinetics
 (c) Third order kinetics (d) Zero order kinetics
46. **Ethyl magnesium bromide reacts with water to form:**
 (a) Ethane (b) Methane
 (c) Propane (d) n-butane
47. **Primary alcohol is obtained by treating Grignard's Regent with:**
 (a) HCHO (b) CH_3CHO (c) CH_3COCH_3 (d) CO_2
48. **In $\text{S}_\text{N}2$ mechanism, the hybridization of carbon atom changes from:** **(RWP 2009)**
 (a) sp (b) sp^2
 (c) dsp^2 (d) none of these
49. **Tertiary alcohol is obtained by treating Grignard reagent with:** **(RWP 2009)**
 (a) HCHO (b) CH_3CHO (c) CH_3COCH_3 (D) CO_2
50. **Order and molecularity of $\text{S}_\text{N}2$ reaction of alkyl halide is:** **(RWP 2011)**
 (a) 1,2 (b) 2,1 (c) 2,2 (d) 0,1

ANSWER KEY

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

CHAPTER 11

ALCOHOLS, PHENOLS AND ETHERS

- Which compound will have maximum repulsion with H₂O?**
(a) C₆H₆ (b) C₂H₅OH (c)
CH₃CH₂CH₂OH (d) C₆H₅OH
- When Ether is protonated, the conjugate acid formed is called:**
(a) A Carbonion (b) Oxide ion
(c) An Oxonium ion (d) A Hydronium ion
- When ethyl bromide is heated with Ag₂O the product formed is:**
(a) Ethanol (b) Ethene
(c) Ethanal (d) Diethyl ether
- When diethyl ether is treated with PCl₅ the product is:**
(a) Ethanol (b) Triethyl phosphine
(c) Ethyl chloride (d) Oxonium ion
- 2-Alkanol on oxidation forms:**
(a) Ether (b) Aldehyde
(c) Ketone (d) Carboxylic acid
- Which substance is used as an Antifreeze:**
(a) Methanol (b) Ethanol
(c) Acetone (d) Acetic acid
- Which of the following would you expect to give a yellow precipitate of CHI₃ when heated with I₂ in alkaline solution:**
(a) CH₃OH (b) C₃H₇OH
(c) CH₃CH₂CH(OH)CH₂CH₃ (d) CH₃CH₂OH
- Alcohols on heating with -----give alkenes at high temperature:**
(a) Oxygen (b) Conc. H₂SO₄
(c) PCl₃ (d) Conc. HNO₃
- Carbolic acid is the other name of:**
(a) Phenol (b) Biphenyl
(c) Picric acid (d) H₂CO₃
- Alcohols and -----react to produce esters:**
(a) Water (b) Ethers
(c) Carboxylic acid (d) Ketones
- Oxidation of -----alcohol gives aldehyde:**
(a) Primary (b) Secondary
(c) Tertiary (d) Quaternary
- Which compound is more soluble in water?**
(a) C₂H₅OH (b) CH₃COCH₃
(c) CH₃OH (d) C₆H₅OH
- Which compound shows maximum hydrogen bonding with water?**
(a) CH₃-O-CH₃ (b) CH₃-OH
(c) C₂H₅-OH (d) C₆H₅-OH
- Which enzyme is not involved in fermentation of starch**
(a) Diastase (b) Maltase
(c) Zymase (d) Urease
- Methyl alcohol is used as:**
(a) a drink (b) an anti freezing agent
(c) a preservative for biological specimen (d) a substitute for petrol
- Only maximum-----% alcohol is obtained by fermentation of molasses:**
(a) 14 (b) 24
(c) 95 (d) 100

- 17. Ethene is formed when Ethyl alcohols reacts with conc. H_2SO_4 at**
 (a) $180^\circ C$ (b) $150^\circ C$
 (c) $120^\circ C$ (d) $110^\circ C$
- 18. Dow's method helps in preparation of:**
 (a) Biphenyl (b) Benzene
 (c) Phenol (d) Ester
- 19. When phenol react with alkali it forms:**
 (a) Acid (b) Salt
 (c) Base (d) None of these
- 20. Phenol reacts with zinc dust and forms:**
 (a) Benzene (b) Acetylene
 (c) Molozonide (d) Ozonide
- 21. Bakelite is formed when phenol reacts with:**
 (a) Acetaldehyde (b) Farmaldehyde
 (c) Propanoic acid (d) Butanoic acid
- 22. Ethers reacts with hydrogen iodide to give:**
 (a) Alcohol (b) Phenol
 (c) Alcohol+ Alkyl halide (d) Aldehyde
- 23. Which one is primary alcohol:**
 (a) Buten-2-ol (b) Propan-2-ol
 (c) Butan-1-ol (d) 2, 3- Dimethylhexane-4-ol
- 24. Ethyl alcohol is industrially prepared from ethylene by:**
 (a) Permanganate oxidation (b) Catalytic reduction
 (c) Absorbing in H_2SO_4 followed by hydrolysis (d) Fermentation
- 25. Ethanol containing some quantity of methanol is called:**
 (a) Absolute spirit (b) Rectified spirit
 (c) Wood spirit (d) Methylated spirit
- 26. Hydrolytic conversion of Sucrose into glucose and fructose in known as:**
 (a) Induction (b) Inversion
 (c) Insertion (d) Inhibition
- 27. Alcohols of low molecular weight are:**
 (a) Soluble in water (b) Soluble in water on heating
 (c) Insoluble in water (d) Insoluble in all solvents
- 28. Fermentation is a:**
 (a) Chemical process (b) Biochemical process
 (c) Engineering process (d) Physical Process
- 29. Ethyl alcohol on oxidation with acidified $K_2Cr_2O_7$ gives:**
 (a) Acetic Acid (b) Acetaldehyde
 (c) Formaldehyde (d) Formic acid
- 30. C_2H_5OH can be differentiated from CH_3OH by:**
 (a) Lucas Test (b) Baeyer's Test
 (c) Iodoform test (d) None
- 31. Ethyl alcohol on treating with Conc. H_2SO_4 at $140^\circ C$ yields:**
 (a) Ethene (b) Diethyl Ether
 (c) Ethyl acetate (d) Ethanoic acid
- 32. Which of the following statements is correct:**
 (a) Phenol is less acidic than Ethanol (b) Phenol is more acidic than Ethanol
 (c) Phenol is more acidic than Acetic acid (d) None
- 33. Isopropyl alcohol on oxidation gives:**
 (a) Acetone (b) Ether
 (c) Ethylene (d) Acetaldehyde
- 34. Which of the following is the most suitable method for removing the traces of water from ethanol:**
 (a) Reacting with Na metal (b) Passing dry HCl through it
 (c) Distilling in presence of CaO (d) Reacting with Mg

- 35. Na reacts with Ethanol to produce:**
 (a) H₂ gas (b) Benzene
 (c) CO₂ gas (d) CO gas
- 36. Picric acid is:**
 (a) 2, 4, 6- Trinitrotoluene (b) 2, 4, 6-Tribromethanol
 (c) 2, 4, 6-Trinitrophenol (d) Para-Nitrophenol
- 37. Organic acidic compound without a carboxylic acid group is:**
 (a) Ascorbic acid (b) Vinegar
 (c) Oxalic acid (d) Picric acid
- 38. Methanol can be prepared from hydrogenation of:** (LHR 2011)
 (a) CH₃CN (b) CH₃Br
 (c) HCHO (d) CH₃CHO
- 39. Phenol reacts with acetyl chloride in the presence of a base to form an:** (LHR 2008)
 (a) acid (b) alcohol (c) aldehyde (d) ester
- 40. Alcohol obtained by fermentation never exceeds:** (LHR 2014)
 (a) 10% (b) 16%
 (c) 14% alcohol (d) 95% alcohol
- 41. Phenol reacts with acetyl chloride in the presence of a base to form an:**
 (a) Acid (b) Alcohol
 (c) Aldehyde (d) Ester
- 42. 2 – Hydroxy propanoic acid is called:**
 (a) Oxalic acid (b) Lactic acid
 (c) Citric acid (d) Aspartic acid
- 43. Methyl alcohol is not used:** (GRW 2014)
 (a) As a substitute for Ethanol in drinking (b) As a substitute for petrol
 (c) For denaturing of ethyl alcohol (d) All
- 44. Which liquid is called wood spirit?** (GRW 2011)
 (a) CH₃OH (b) C₂H₅OH
 (c) CH₃COOH (d) CH₃OCH₃
- 45. Order of reactivity of alcohols when C-O bond breaks is:** (LHR 2012)
 (a) Tertiary alcohol>Secondary alcohol>Primary alcohol
 (b) Primary alcohol>Secondary alcohol>Tertiary alcohol
 (c) Secondary alcohol>Primary alcohol>Tertiary alcohol
 (d) Tertiary alcohol>Primary alcohol >Secondary alcohol
- 46. Which compound is called a universal solvent?**
 (a) H₂O (b) CH₃OH
 (c) C₂H₅OH (d) CH₃OCH₃
- 47. Ethanol and methanol can be distinguished by** (MTN 08, FSD 10)
 (a) Iodoform test (b) Lucas Test
 (c) Benedicts test (d) Tollen's test
- 48. Ethers show the phenomena of:**
 (a) Position isomerism (b) Functional group isomerism
 (c) Metamerism (d) Cis-trans isomerism
- 49. Which enzyme is not involved in fermentation of starch?** (LHR 2014,15)
 (a) Diastase (b) Zymase
 (c) Urease (d) Invertase
- 50. Which of the following reagent will replace –OH group of alcohol by halogen atoms?**
 (a) HOCl (b) Br₂ (c) SOCl₂ (d) I₂

ANSWER KEY

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

CHAPTER 12

ALDEHYDES AND KETONES

- Which one of the following undergoes Cannizzaro's reaction in the presence of dilute aqueous sodium hydroxide?**
(a) HCHO (b) CH₃CHO
(c) CH₃-CH₂-CHO (d) CH₃-COCH₃
- Formaldehyde condenses with phenol in the presence of dilute base to yield:**
(a) Nylon-6,6 (b) Urotropine
(c) Aniline-formaldehyde (d) Bakelite
- Calcium acetate on dry heating yields:**
(a) HCHO (b) CH₃CHO
(c) CH₃COCH₃ (d) CH₃COOH
- Air oxidation of methanol produces:**
(a) Ethanol (b) Methanal
(c) Mixture of Methanal and Ethanal (d) Methane
- Acetone reacts with HCN to form cyanohydrin, It is an example of:**
(a) Electrophilic addition (b) Electrophilic substitution
(c) Nucleophilic addition (d) Nucleophilic substitution
- Which of the following compounds will not give Iodoform:**
(a) Acetaldehyde (b) Acetone
(c) Butanone (d) 3-Pentanone
- Addition of alcohol in carbonyl compounds gives acetal; the geometry of acetal is:**
(a) Linear (b) Trigonal
(c) Tetrahedral (d) Planar
- Which of the following compound will react with Tollen's reagent:**
(a) Acetone (b) Acetic acid
(c) Methyl ethyl ketone (d) Acetaldehyde
- Which of the reagents will react with Ketones only:**
(a) Sodium nitroprusside (b) Tollen's reagent
(c) Fehling's reagent (d) Benedict's reagent
- The Nucleophilic addition reactions of carbonyl compounds are catalyzed by:**
(a) Acids (b) Bases
(c) Both a and b (d) None of these
- Acetaldehyde is distinguished from other aldehydes by:**
(a) Iodoform test (b) Tollen's reagent
(c) Silver mirror test (d) all of these
- Which is used in the preparation of throat lozenges:**
(a) Formaldehyde (b) Acetaldehyde
(c) Menthol (d) Menthone
- Which is used as an antiseptic inhalant:**
(a) Formaldehyde (b) Acetaldehyde
(c) Formic acid (d) Acetic acid
- Aldehyde forms acetal when they combine with alcohols in the presence of:**
(a) Hydrogen Iodide (b) Hydrogen gas
(c) Hydrogen Chloride (d) Sodium Hydroxide
- Which of the following groups does not show catalytic oxidation:**
(a) Aldehyde (b) Alcohol
(c) Carboxylic acid (d) Ketone

- 16. Isopropyl alcohol on oxidation forms:**
 (a) Acetone (b) Ether
 (c) Ethylene (d) Acetaldehyde
- 17. Which of the following reactions is used for detecting the presence of carbonyl group?**
 (a) Reaction with hydroxylamine (b) Ammonical cuprous oxide
 (c) Ammonical silver bromide (d) Ammonical silver nitrate
- 18. Propyne on hydrolysis in presence of H_2SO_4 and $HgSO_4$ gives:**
 (a) Acetaldehyde (b) Acetone
 (c) Formaldehyde (d) None
- 19. On heating acetaldehyde with Ammonical silver nitrate solution, we get:**
 (a) CH_3OH (b) Silver acetate
 (c) $HCHO$ (d) Silver mirror
- 20. At room temperature formaldehyde is:**
 (a) Gas (b) Liquid
 (c) Solid (d) Rubber like solid
- 21. The compound obtained by the reduction of Propionaldehyde with amalgamated Zinc and concentrated HCl is:**
 (a) Propanol (b) Propane
 (c) Propane (d) All
- 22. Aromatic Aldehydes undergo disproportionation reaction in presence of sodium or potassium hydroxide to give corresponding alcohol and acid. The reaction is known as:**
 (a) Wurtz reaction (b) Cannizzaro reaction
 (c) Friedel-Craft reaction (d) None
- 23. Which of the following is used in formation of hypnotic drug:**
 (a) Chloral hydrate (b) Ethanol Tetramer
 (c) Ethanol Trimer (d) both a and c
- 24. When vapors of Isopropyl alcohol are passed over heated copper, the major product obtained is:**
 (a) Propane (b) Propylene
 (c) Acetaldehyde (d) Acetone
- 25. A Nucleophilic reagent will readily attack on:**
 (a) Ethylene (b) Ethanal
 (c) Ethanol (d) Ethylamine
- 26. Which of the following does not react with phenyl hydrazine:**
 (a) Ethanol (b) Ethanal
 (c) Acetone (d) Acetophenone
- 27. Self condensation of Acetaldehyde in the presence of dilute alkali gives:**
 (a) An acetal (b) An aldol
 (c) Paraldehyde (d) Acetone
- 28. Which of the following does not give brick red ppt. with Fehling solution:**
 (a) Formalin (b) Acetaldehyde
 (c) D-Glucose (d) Acetone
- 29. Formalin is 40% aqueous solution of:**
 (a) Furfural (b) Formaldehyde
 (c) Formic acid (d) Methyl iodide
- 30. Acetone is oxidized with:**
 (a) Tollen's reagent (b) Fehling solution
 (c) Acidified dichromate solution (d) Benedicts solution
- 31. Concentrated Sodium hydroxide and Benzaldehyde reacts to produce:**
 (a) Benzyl alcohol (b) Hydrobenzamide
 (c) Cinnamic acid (d) Benzophenone

- 32. Wolf-Kishner reduction is used for the reduction of.**
 (a) Nitro compounds (b) Carboxylic acids
 (c) Carbonyl compounds (d) Olefins
- 33. C_2H_5CHO and $(CH_3)_2CO$ can be distinguished by testing with:**
 (a) Phenyl hydrazine (b) Hydroxylamine
 (c) Fehling solution (d) Sodium bisulphate
- 34. Clemmenson's reduction of Ketones is carried out with:**
 (a) H_2 with Pd catalyst (b) $KOH+N_2H_4$
 (c) $LiAlH_4$ in water (d) Zn-Hg with conc. HCl
- 35. Which of the following organic compounds exhibits positive Fehling test as well as Iodoform test:**
 (a) Methanal (b) Ethanol
 (c) Propanone (d) Ethanal
- 36. Which of the following reactants will render Tertiary butyl alcohol on reacting with methyl magnesium iodide?**
 (a) HCHO (b) CH_3CHO
 (c) CH_3COCH_3 (d) CO_2
- 37. Bisulphite adduct is:**
 (a) Yellow ppt (b) Crystalline white ppt
 (c) Greenish Crystalline (d) Red solid
- 38. The IUPAC name of $CH_3COCH(CH_3)_2$ is:**
 (a) 4-Methylisopropyl ketone (b) 3-Methyl-2-butanone
 (c) Isopropylmethyl ketone (d) 2-Methyl-2 butanone
- 39. Which of the following reagents will react with both Aldehydes and Ketones?**
 (a) Fehling's reagent (b) Tollen's reagent
 (c) Grignard's reagent (d) Benedicts reagent
- 40. Tollen's reagent is:**
 (a) Alkaline solution containing Potassium tartarate
 (b) Alkaline solution containing Potassium citrate
 (c) Ammonical $AgNO_3$
 (d) Ammonical Cu_2Cl_2
- 41. Which compounds will not give Iodoform test on treatment with $I_2/NaOH$?**
 (a) Acetaldehyde (b) Acetone
 (c) Butanone (d) 3-Pentanone
- 42. The carbon atom of the carbonyl group is:**
 (a) sp hybridized (b) sp^2 hybridized
 (c) sp^3 hybridized (d) None of these
- 43. Ketones are prepared by the oxidation of:**
 (a) Primary alcohols (b) Secondary alcohols
 (c) Tertiary alcohols (d) None
- 44. Acetone reacts with HCN to form cyanohydrin. It is an example of:**
 (a) Electrophilic addition (b) Electrophilic substitution
 (c) Nucleophilic addition (d) Nucleophilic substitution
- 45. Catalyst used for the laboratory preparation of formaldehyde is:**
 (a) ZnO (b) Al_2O_3 (c) Platinized Asbestos (d) None
- 46. Hybridization of carbon in carbonyl group is: (FSD 2010, GRW 2011)**
 (a) sp^3 (b) sp^2 (c) dsp^2 (d) sp
- 47. Cannizzaro's reaction is not given by: (GRW 13, 14, LHR 12, 13, BWP 15)**
 (a) Formaldehyde (b) Acetaldehyde
 (c) Benzaldehyde (d) Trimethyl acetaldehyde

- 48. Ketones are always reduced to:** (RWP 2008)
 (a) Primary alcohol (b) Secondary alcohol
 (c) Tertiary alcohol (d) None of these
- 49. Aldol product on heating undergoes:** (RWP 2009)
 (a) Decomposition (b) Dehydration
 (c) Rearrangement (d) None of these
- 50. Acidified oxidizing agent for the laboratory preparation of acetaldehyde is:** (RWP 2010)
 (a) $K_2Cr_2O_7+H_2O$ (b) $Na_2Cr_2O_7+H_2SO_4$
 (c) $K_2Cr_2O_7+H_2S$ (d) $Na_2Cr_2O_7+NO_2$

ANSWER KEY

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

CHAPTER 13

CARBOXYLIC ACIDS

- Which acid of the following is not a fatty acid?**
(a) Propanoic acid (b) Phthalic acid
(c) Butanoic acid (d) Acetic acid
- Which reagent is used to reduce a carboxylic group to an alcohol?**
(a) H_2/Ni (b) H_2/Pt
(c) H_2/Pd (d) $LiAlH_4$
- Sodium acetate and Acetyl chloride react to give:**
(a) Acetic acid (b) Acetone
(c) Acetic anhydride (d) None
- Acetic acid and formic acid, both exist as cyclic dimer in vapour state because of:**
(a) Hydrogen bonding (b) Polymerization
(c) Condensation (d) Distillation
- Nature of Glycine amino acid is:**
(a) Neutral (b) Acidic
(c) Basic (d) None
- Acetic acid is obtained when**
(a) CH_3OH is oxidized (b) Calcium acetate is distilled
(c) Ethanol is oxidized (d) Ammonium carbonate is heated
- Which one of the following products is not formed when acetic acid reacts with PCl_5 ?**
(a) CH_3COCl (b) HCl
(c) $POCl_3$ (d) CH_3Cl
- Which of following derivative cannot be prepared directly from acetic acid?**
(a) Acetamide (b) Acetyl chloride
(c) Acetic anhydride (d) Ethyl acetate
- Acetamide is prepared by:**
(a) Heating ammonium acetate (b) Heating methyl cyanide
(c) Hydrazine (d) Mixture of NH_4Cl and acetic acid
- Which Ester is used for the flavor of Banana:**
(a) Benzyl acetate (b) Amyl acetate
(c) Isobutyl formate (d) Ethyl butyrate
- Freezing point of acetic acid is:**
(a) $-17^\circ C$ (b) $17^\circ C$
(c) $-118^\circ C$ (d) Room temperature
- Glacial acetic acid is miscible in all proportions with:**
(a) Water (b) Ether
(c) Alcohol (d) All of these
- The carbon atom of a carbonyl group is:**
(a) Unhybridized (b) sp hybridized
(c) sp^2 hybridized (d) sp^3 hybridized
- The boiling points of the Carboxylic acid are:**
(a) High (b) Low
(c) Extremely low (d) Extremely high
- Carboxylic acids on reaction with Lithium hydride are reduced to:**
(a) Aldehyde (b) Alkene
(c) Alcohol (d) Ester
- Which of following is commonly known as vinegar:**
(a) Formic acid (b) Butanoic acid
(c) Formaldehyde (d) Acetic acid

- 17. When Ethyl alcohol is oxidized with $K_2Cr_2O_7$ and dilute H_2SO_4 , which of the following is produced:**
 (a) Formaldehyde (b) Acetic acid
 (c) Butanoic acid (d) Formic acid
- 18. Zwitterion is also called:**
 (a) Dipolar ion (b) Internal Salt (c) both a and b
 (d) Non polar ion
- 19. Amino acids can be synthesized by reaction of α -Bromo acid with:**
 (a) Ammonia Chloride (b) Urea (c) Ammonium
 (d) Formaldehyde
- 20. Reaction of acids with alcohols is known as:**
 (a) Esterification (b) Saponification (c)
 Neutralization (d) None
- 21. Toluene can be oxidized to Benzoic acid by:**
 (a) $KMnO_4$ (acidic medium) (b) $K_2Cr_2O_7$ (acidic medium)
 (c) Both a and b (d) None
- 22. When two moles of acetic acid are heated with P_2O_5 the product formed is:**
 (a) 2 moles of ethyl alcohol (b) Two moles of Acetone
 (c) Acetic anhydride (d) Ethyl acetate ester
- 23. Of the following four reactions, formic acid and acetic acid differ in which respect?**
 (a) Replacement of hydrogen by sodium (b) Formation of ester with alcohol
 (c) Reduction of Fehling solution (d) Blue litmus reaction
- 24. Glacial Acetic acid at $17^\circ C$ is:**
 (a) Colourless liquid (b) Ice like solid
 (c) Waxy solid (d) A gas
- 25. Weakest acid among the followings is:**
 (a) Acetic acid (b) Phenol
 (c) Water (d) Acetylene
- 26. Ethyl alcohol reacts with acetyl chloride to form:**
 (a) Ethyl chloride (b) Acetic acid
 (c) Methylacetate (d) Ethyl acetate
- 27. Which of the following is the strongest acid:**
 (a) CF_3COOH (b) CBr_3COOH
 (c) CH_3COOH (d) CCl_3COOH
- 28. $HCOOH$ reacts with conc. H_2SO_4 to produce:**
 (a) $CO+H_2O$ (b) CO_2+H_2
 (c) $HCHO$ (d) None
- 29. Hydrolysis of an ester gives a carboxylic acid which on Kolbe's electrolysis yields ethane, the ester is**
 (a) Ethyl methanoate (b) Methyl ethanoate
 (c) Ethyl acetate ester (d) None
- 30. Carboxylic acids are more acidic than phenol and alcohol because of:**
 (a) Intermolecular hydrogen bonding
 (b) Formation of Dimers
 (c) Highly acidic hydrogen
 (d) Resonance stabilization of their conjugate base (Carboxylate ion)
- 31. Organic compounds having fruity smell are:**
 (a) Carboxylic acids (b) Alcohols
 (c) Ethers (d) Esters
- 32. The solution of the acid used for seasoning of food is:**
 (a) Formic acid (b) Acetic acid
 (c) Benzoic acid (d) Butanoic acid
- 33. Which of the following is not a fatty acid?**
 (a) Propanoic acid (b) Acetic acid
 (c) Phthalic acid (d) Butanoic acid

34. **Acetic acid was first isolated from:**
 (a) Butter (b) vinegar (c) Milk (d) Red ant
35. **Acetic acid was first isolated from:**
 (a) Butter (b) Vinegar (c) Milk (d) Red ant
36. **The molecular mass of protein is:**
 (a) Less than 10,000 (b) Greater than 10,000
 (c) Equal to 10,000 (d) Equal to 9,000
37. **Amino acids are prepared by:**
 (a) Williamson's synthesis (b) Strecker's synthesis
 (c) Wurtz's synthesis (d) Perkin's reaction
38. **The molecular mass of protein is:**
 (a) Less than 10,000 (b) Greater than 10,000
 (c) Equal to 10,000 (d) Equal to 9000
39. **Molar mass of CH_3COOH obtained by elevation of boiling point method is: (LHR 2011)**
 (a) 30 (b) 60
 (c) 120 (d) 180
40. **Which compound is polyprotic acid?**
 (a) CH_3COOH (b) $\text{C}_6\text{H}_4(\text{OH})\text{COOH}$
 (c) $(\text{COOH})_2$ (d) $\text{C}_6\text{H}_5\text{OH}$
41. **Dipolar structure of zwitterions is also called:**
 (a) Double salt (b) Health salt
 (c) Internal salt (d) External salt
42. **The flavor of amyl acetate is:**
 (a) Orange (b) Apricot
 (c) Pine apple (d) Banana
43. **Acetic acid is manufactured by: (LHR 14, GRW 14,15, RWP 10)**
 (a) Distillation (b) Fermentation
 (c) Ozonolysis (d) Esterification
44. **The organic acid that does not have carboxyl group is:**
 (a) Formic acid (b) Picric acid
 (c) Formaldehyde (d) Acetone
45. **Tyrosine was first isolated from. (RWP 2008)**
 (a) Sugar (b) Cheese
 (c) Butter (d) Milk
46. **Phthalic acid is a: (RWP 2009)**
 (a) Monocarboxylic acid (b) Dicarboxylic acid
 (c) Tricarboxylic acid (d) None of these
47. **The reagent used to convert carboxylic acid directly to alkane is (RWP 2008)**
 (a) HI/P (b) NaBH_4
 (c) LiAlH_4 (d) H_2/Ni
48. **Which acid is used in the manufacture of synthetic fiber? (MTN 2015)**
 (a) Formic acid (b) Oxalic acid
 (c) Carbonic acid (d) Acetic acid
49. **The amino acids which cannot be synthesized by our body are: (MTN 2008)**
 (a) 5 (b) 10
 (c) 15 (d) 20
50. **Which one of the following is an unsaturated carboxylic acid? (MTN 2009)**
 (a) Malonic acid (b) Oxalic acid
 (c) Succinic acid (d) Maleic acid

ANSWER KEY

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

CHAPTER 14

MACROMOLECULES

- Which of these polymers is a synthetic polymer:**
(a) Animal fat (b) Starch
(c) Cellulose (d) Polyester
- Which one of the following enzymes brings about the hydrolysis of fats:**
(a) Urease (b) Maltase
(c) Zymase (d) Lipase
- To which class of compounds cholesterol belongs:**
(a) Steroids (b) Phospholipids
(c) Vitamins (d) Triglycerides
- Which of the following is an ester:**
(a) Soap (b) Starch
(c) PVC (d) Triglyceride
- Which one of the following is an inorganic polymer:**
(a) Graphite (b) Rubber
(c) DNA (d) Protein
- The linear sequence of amino acids in a protein is called:**
(a) Primary Structure (b) Secondary Structure
(c) Tertiary Structure (d) Quaternary structure
- In which of these processes are small organic molecules made into macromolecule:**
(a) The cracking of petroleum fractions (b) The fractional distillation of crude oil
(c) Formation of Polyethene (d) The hydrolysis of proteins
- Which of these polymers is synthetic:**
(a) Animal fat (b) Starch
(c) Cellulose (d) Polyester
- Which Carbohydrate can be used for silvering of mirror:**
(a) Glucose (b) Fructose
(c) Maltose (d) all
- Monosaccharide contains ____ carbon atoms:**
(a) 3 to 6 (b) 3 to 7
(c) 6-7 (d) 7-10
- Which of the following is not obtained by condensation polymerization:**
(a) Polyester (b) Nylon
(c) Polystyrene (d) None
- Which of the following is a Polyamide:**
(a) Polyester (b) Orlon
(c) Polystyrene (d) Nylon
- Orlon is polymer of:**
(a) T.F.E (b) Acrylonitrile
(c) Ethanoic acid (d) Benzene
- The raw material used to form Nylon is ____**
(a) Adipic acid (b) Butadiene
(c) Isoprene (d) Ethylene
- The example of Copolymer:**
(a) Polyester (b) Polystyrene
(c) Polyethene (d) None
- Poly vinyl acetate is used as:**
(a) Explosive material (b) Adhesive material
(c) Rubber (d) Filler
- Polyamide resins are formed by condensation of poly amines with aliphatic:**
(a) Carboxylic acid (b) Alcohol
(c) Aldehydes (d) Dicarboxylic acid

- 18. The Epoxy resin is made by condensation of Epichlorohydrin with:**
 (a) Diphenylol propane (b) Phenyl propane
 (c) Phenyl acetate (d) Dicarboxylic acid
- 19. The table sugar is:**
 (a) Glucose (b) Sucrose
 (c) Maltose (d) Lactose
- 20. Raffinose is an example of :**
 (a) Mono saccharide (b) Disaccharide
 (c) Trisaccharide (d) None
- 21. The example of compound protein is:**
 (a) Phosphoprotein (b) Peptones
 (c) Albumin (d) Globulins
- 22. The optimum PH of salivary amylase is from 6.4 to:**
 (a) 6.8 (b) 6.9
 (c) 7.0 (d) None
- 23. The reagent which forms crystalline glucosazone derivative when treated with glucose is:**
 (a) Fehling solution (b) Phenyl hydrazine
 (c) Benedict solution (d) Hydroxyl amine
- 24. Ascorbic acid is a chemical name of:**
 (a) Vitamin D (b) Vitamin A
 (c) Vitamin C (d) Vitamin B₆
- 25. The main structural feature of proteins is:**
 (a) An ester linkage (b) An ether linkage
 (c) The peptide linkage (d) All
- 26. The fiber which is made from acrylonitrile as monomer is: (LHR-09)**
 (a) PVC (b) Rayon fiber
 (c) Acrylic fiber (d) Polyester fiber
- 27. The disaccharide present in milk is:**
 (a) Sucrose (b) Maltose
 (c) Lactose (d) Cellobiose
- 28. On hydrolysis of starch, we finally get:**
 (a) Glucose (b) Fructose
 (c) Both a and b (d) Sucrose
- 29. Enzymes in the living systems:**
 (a) Provide energy (b) Provide immunity
 (c) Transport oxygen (d) Catalyze biochemical processes
- 30. Bakelite is obtained from phenol by reacting with:**
 (a) Acetaldehyde (b) Acetal
 (c) Formaldehyde (d) Chlorobenzene
- 31. Enzyme used for the treatment of blood cancer in children is: (GRW-10)**
 (a) Cellulose (b) Urease
 (c) L-asparaginase (d) lactic dehydrogenase
- 32. Which of the following is not present in nucleotide:**
 (a) Guanine (b) Cytosine
 (c) Adenine (d) Tyrosine
- 33. Which of the following has magnesium in its structure:**
 (a) Carbonic anhydrase (b) Haemocyanin
 (c) Chlorophyll (d) Vitamin B₁₂
- 34. The number of amino acids found in proteins that a human body can synthesize is**
 (a) 20 (b) 10
 (c) 5 (d) 14
- 35. Which of the following is an example of Keto-hexose:**
 (a) Glucose (b) Raffinose
 (c) Maltose (d) Fructose

- 36. The group linkage present in Carbohydrates:**
 (a) Peptide linkage (b) Ester linkage
 (c) Glycosidic linkage (d) Diester linkage
- 37. Teflon, styrene and Neoprene are all:**
 (a) Copolymers (b) Condensation polymers
 (c) Homopolymers (d) Monomers
- 38. Which of the following is fully fluorinated polymer?**
 (a) Neoprene (b) Teflon
 (c) Thiokol (d) PVC
- 39. The degree of unsaturation of a fat or an oil is checked by its:**
 (a) Hydrogenation number (b) Iodine number
 (c) Saponification number (d) Octane number
- 40. Starch is a polymer of:**
 (a) Fructose (b) α -D-Glucose
 (c) Sucrose (d) Lactose
- 41. Which one of the following enzymes brings about the hydrolysis of fats?**
 (a) Urease (b) Maltase
 (c) Zymase (d) Lipase
- 42. Which of these polymers is an addition polymer?**
 (a) Nylon-6,6 (b) Polystyrene
 (c) Terylene (d) Epoxy resin
- 43. Epoxy resins are fundamentally:**
 (a) Polyamide (b) Polyethers
 (c) Polyesters (d) Polyvinyl
- 44. Which one of the following acid is used to prepare synthetic fiber?**
 (a) Carbonic acid (b) Formic acid
 (c) Acetic acid (d) Butyric acid
- 45. Which statement about glucose and sucrose is incorrect?**
 (a) Both are soluble in water (b) Both occur naturally
 (c) Both are carbohydrates (d) Both are disaccharides
- 46. The fiber which is made from acrylonitrile as monomer is:**
 (a) PVC (b) Rayon fiber (c) Acrylic Fiber (d) polyester
 fiber
- 47. Which of these polymers is an addition polymer?**
 (a) Polystyrene (b) Nylon-6,6 (c) Polyester (d) Epoxy resin
- 48. Enzyme used for the treatment of blood cancer in children is:**
 (a) Cellulose (b) Urease
 (c) L-Asparaginase (d) Lactic dehydrogenase
- 49. Nylon-6,6 is obtained by heating hexa methylene diamine with: (FSD 2010)**
 (a) Adipic acid (b) Acetic acid
 (c) Vinyl chloride (d) Acrylic acid
- 50. Polymerization of acrylonitrile give: (FSD 2011)**
 (a) PVC (b) Rayon Fiber
 (c) Acrylic fiber (d) Polyester fiber

ANSWER KEY

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

CHAPTER 15

COMMON CHEMICAL INDUSTRIES IN PAKISTAN

- The percentage of nitrogen in NH_3 is:**
(a) 46% (b) 60%
(c) 82% (d) 100%
- Potassium fertilizers are useful for:**
(a) Tobacco (b) Coffee
(c) Potato (d) all of these
- Which one of the following raw materials is not used in the cement manufacture:**
(a) Lime stone (b) Gypsum
(c) Blast furnace slag (d) Lead
- White water is:**
(a) Hard water
(b) Water obtained from a crystal by heating
(c) Water which is obtained from pulp, through screen at Fourdrinier table
(d) Water which is removed from amino acids when they form peptide bond
- The % of Nitrogen in Ammonium Nitrate is:** (GRW 2009)
(a) 46% (b) 82%
(c) 33% (d) 16%
- Which is not a calcareous material?** (SGD 14, MTN 11,13, LHR 14,15)
(a) lime (b) clay
(c) marble (d) marine shell
- The nitrogenous fertilizer easily taken up by plants is:** (LHR 2011)
(a) Urea (b) Ammonium nitrate
(c) Ammonia gas (d) Ammonia solution
- Ammonium nitrate fertilizer is not used for which crops?** (LHR 2010)
(a) Cotton (b) Wheat
(c) Sugarcane (d) Paddy rice
- Point out raw material which is most suitable for manufacturing of urea:**
(a) CO_2 , N_2 , H_2 (b) N_2 , H_2 , CO
(c) CH_4 , N_2 , H_2 (d) H_2 , N_2
- Which one of the following fertilizers has maximum manufacturing plants in Pakistan:**
(a) Urea (b) Ammonia
(c) Ammonium phosphate (d) Ammonium nitrate
- Phosphorous helps the growth of:** (LHR 14, MTN, FSD, SWL 15)
(a) Root (b) Leave
(c) Stem (d) Seed
- Which of the following nitrogen fertilizer contains more nitrogen:**
(a) NaNO_3 (b) KNO_3
(c) NH_4NO_3 (d) Urea
- Urea contains about**
(a) 48% Nitrogen (b) 46% Nitrogen
(c) 44% Nitrogen (d) 42% Nitrogen
- Potassium nitrate is prepared by direct reaction between potassium chloride and**
(a) Nitric acid (b) Nitrosyl chloride
(c) Sodium nitrate (d) Nitrate ions

15. **The total production of urea fertilizer in Pakistan is:**
 (a) 56,20,10 metric tons /annum (b) 56,25,100 metric tons/ annum
 (c) 56, 23,100 metric tons/annum (d) 56, 30,100 metric tons /annum
16. **For Chemical pulping, the principal methods used are:**
 (a) Five (b) Four
 (c) Three (d) Two
17. **During setting of cement, Tricalcium silicate and tri-calcium aluminate are get hydrolyzed to produce calcium hydroxide and**
 (a) $\text{Ca(OH)}_2 \cdot 2\text{H}_2\text{O}$ (b) $\text{CaCO}_3 \cdot 2\text{H}_2\text{O}$
 (c) Al(OH)_3 (d) CaCO_2
18. **For manufacture of Portland cement main materials are:**
 (a) Lime and Silica (b) Alumina and Magnesia
 (c) Silica and FeO (d) Clay and Shale
19. **In cement manufacture, 75% Lime stone is used to get:**
 (a) 62% Lime (b) 60% Lime
 (c) 75% Lime (d) None
20. **The natural fertilizer is called:**
 (a) Manure (b) Urea
 (c) Super phosphate (d) Ammonium sulphate
21. **Which of the following elements is not a micro nutrient? (RWP 2009)**
 (a) Cu (b) Fe (c) Mg (d) Mo
22. **Macronutrients are required for an acre of land in quantity ranging from: (SGD 14, RWP 10)**
 (a) 2-200Kg (b) 3-200Kg
 (c) 4-200Kg (d) 5-200Kg
23. **Calendar stock is the stage of paper making where?**
 (a) Paper is stored (b) Thickness is reduced
 (c) water is removed (d) Stock is reduced to 1%
24. **Which non-woody raw material is used for making pulp and paper?**
 (a) Fur (b) Rice/wheat straw (c) Eucalyptus (d) Poplar
25. **The hottest zone in rotary kiln is: (MTN 2008)**
 (a) Drying (b) Pre-heating
 (c) Burning (d) Decomposition
26. **Which sequence of steps is correct for the manufacture of cement?**
 (a) Mixing, heating, grinding, crushing
 (b) Crushing, heating, mixing, grinding
 (c) Crushing, heating, mixing, grinding
 (d) Crushing, grinding, mixing, heating
27. **It is not used in paper and pulp industry: (MTN 2009)**
 (a) Bamboo (b) Cotton stalk (c) Poplar (d) He gas
28. **A manure is: (MTN 2009)**
 (a) An organic compound (b) An inorganic compound
 (c) A mixture of organic and inorganic compounds (d) A mixture of inorganic compounds
29. **The fertilizer that contains largest amount of nitrogen nutrient is:**
 (a) Liquid nitrogen (b) Urea
 (c) Liquid ammonia (d) Ammonium nitrate
30. **Argillaceous material in the following is: (MTN 2011)**
 (a) Lime (b) Clay
 (c) Marble (d) Marine shell
31. **Which substance in cement has greater percentage? (BWP 2008)**
 (a) Silica (SiO_2) (b) Lime (CaO)
 (c) Iron Oxide (Fe_2O_3) (d) Alumina (Al_2O_3)

- 32. Which one is an organic fertilizer:** (BWP 2009)
 (a) Manure (b) Ammonium nitrate
 (c) Urea (d) both a & c
- 33. Which one is a micronutrient?** (BWP 2010)
 (a) Boron (b) Nitrogen
 (c) Phosphorous (d) Potassium
- 34. The fertilizer which contains 46% nitrogen is:** (DGK 2009)
 (a) Urea (b) Ammonia
 (c) Ammonium nitrate (d) none of these
- 35. Argillaceous material used for the manufacture of cement provides**
 (a) Basic components (b) Amphoteric compounds
 (c) Acidic components (d) both acidic and basic component
- 36. Diammonium Phosphate contains:** (BWP 2012)
 (a) 18% Nitrogen (b) 48% P₂O₅
 (c) 88% plant nutrients (d) 10% Nitrogen
- 37. The % of lime (CaO) in Portland cement is:** (SGD 2012)
 (a) 1.0 (b) 2.5
 (c) 62.0 (d) 60.0
- 38. The % of gypsum in Portland cement is:** (LHR 2012)
 (a) 4-5% (b) 9-4%
 (c) 2-3% (d) 1-2%

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
c	d	d	c	c	b	c	d	a	a
11	12	13	14	15	16	17	18	19	20
b	d	b	c	d	c	c	a	a	a
21	22	23	24	25	26	27	28	29	30
c	d	b	b	c	d	d	a	c	b
31	32	33	34	35	36	37	38		
b	d	a	a	c	b	c	a		

CHAPTER 16

ENVIRONMENTAL CHEMISTRY

- Disinfection of water by chlorine is done by the production of:** (LHR 2005)
(a) NH_2Cl (b) NCl_3
(c) HOCl (d) NHCl_2
- Following is better to disinfect water:** (LHR 2011)
(a) Cl_2 (b) O_2
(c) O_3 (d) KMnO_4
- In which layer of the atmosphere is Ozone present:**
(a) Thermosphere (b) mesosphere
(c) Stratosphere (d) Troposphere
- Which one of the following is not a pollutant:**
(a) CO_2 (b) NO_2
(c) CO (d) SO_2
- The smog which has high contents of SO_2 in it, is called:**
(a) Reducing smog (b) Oxidizing smog
(c) Natural smog (d) Neutral smog
- Which one of the following diseases is not eradicated by the pesticides:**
(a) Sleeping sickness (b) Rickets
(c) Malaria (d) Yellow fever
- C.O.D of water can be determined directly:**
(a) $\text{Cr}_2\text{O}_3^{-2}$ (b) CrO_4^-
(c) Cr^{+3} (d) $\text{Cr}_2\text{O}_7^{-2}$
- Cracking of Polyethene at high temperature gives:**
(a) Allotropes (b) Isomorphs
(c) Polymers (d) Monomers
- The residual ash after incineration of industrial waste is disposed off in a landfill, which is lined with:** (LHR 2011)
(a) Portland cement (b) Clay and plastic
(c) Stone-ware (d) Methyl silicone
- The temperature in the non-rotating chamber in the incineration of industrial hazardous waste process has a range:** (DGK 09, GRW 08)
(a) 950 to 1300 °C (b) 900 to 1000 °C
(c) 250 to 500 °C (d) 500 to 900 °C
- The thickness of atmosphere is:** (BWP 2015)
(a) 1500 Km (b) 1000 Km
(c) 500 Km (d) 100 Km
- The fresh water being used for domestic purpose is:** (FSD-10, BWP-09)
(a) 8% (b) 23%
(c) 69% (d) 100%
- The normal amount of overhead ozone is:** (FSD-10, MTN-08,10, DGK-08)
(a) 300 Du (b) 350 Du
(c) 400 Du (d) 450 Du
- The normal amount of overhead Ozone is about:**
(a) 250 D.U (b) 300 D.U
(c) 350 D.U (d) 400 D.U
- The mean residence time of methane in the atmosphere:**
(a) 3-6 years (b) 3-5 years
(c) 3-7 years (d) 3-8 years
- Photochemical smog consists of high concentration of:**
(a) Oxidants (b) Reductants
(c) Acids (d) Bases

- 17. The boiling point of Ozone is very:**
 (a) High (b) Low
 (c) 10 °C (d) -10 °C
- 18. In clean water, molecular oxygen ranges from:**
 (a) 4-7 ppm (b) 4-9 ppm
 (c) 4-8 ppm (d) 4-10 ppm
- 19. The recycling of plastic involves:**
 (a) Re-processing (b) Depolymerization
 (c) Transformation (d) All
- 20. Which of following is three times lighter than air:**
 (a) Carbon monoxide (b) Carbon dioxide
 (c) Both a and b (d) None
- 21. Atmosphere of big/metropolitan cities is polluted most by:**
 (a) Automobile exhausts (b) Pesticide residue
 (c) Household waste (d) Radio-active fall out
- 22. Chief air pollutant which is likely to deplete Ozone layer:**
 (a) Sulphur dioxide (b) Carbon monoxide
 (c) Carbon dioxide (d) NO_x + CFC's
- 23. Pollutant of automobile exhausts that affects nervous system and produces mental disease is:**
 (a) Mercury (b) Lead
 (c) Nitrogen oxide (d) Sulphur oxide
- 24. SO₂ and NO₂ produce air pollution in the form of:**
 (a) Smog (b) Acidic Rain
 (c) Both a and b (d) None
- 25. Carbon monoxide is a pollutant as it:**
 (a) Inactivates nerves (b) Inhibits glycolysis
 (c) Combines with oxygen (d) Combines with hemoglobin
- 26. Acid rains are produced by:**
 (a) Excess NO₂ and SO₂ from burning fossil fuels
 (b) Excess production of NH₃ by industry and coal gas
 (c) Excess release of carbon monoxide by incomplete combustion
 (d) Excess formation of CO₂ by combustion and animal respiration
- 27. Atmospheric pollutant is:**
 (a) CO₂ (b) CO
 (c) O₂ (d) N₂
- 28. Increased asthmatic attacks in certain seasons are related to :**
 (a) Inhalation of seasonal pollen (b) Eating of seasonal vegetables
 (c) Low temperature (d) Wet and dry environment
- 29. Ozone depletion in stratosphere results in:**
 (a) Forest fires (b) Increased incidence of skin cancer
 (c) Global warming (d) None
- 30. Pollution is:**
 (a) Removal of top soil
 (b) Release of toxic/undesirable materials in environment
 (c) Wastage of energy
 (d) All of above
- 31. Which causes water pollution:**
 (a) Smoke (b) Automobile exhausts
 (c) Pesticides (d) All
- 32. BOD is connected with:**
 (a) Organic matter (b) Microbes
 (c) Microbes and organic matter (d) None
- 33. UV radiations bring about:**
 (a) Skin cancer (b) Mouth cancer
 (c) Lung cancer (d) Liver cancer

- 34. BOD is:**
 (a) Biological oxygen deficit (b) Biosphere oxygen demand
 (c) Biological oxygen demand (d) None of the above
- 35. Water pollution is mainly due to**
 (a) Sulphur dioxide (b) Carbon dioxide
 (c) Carbon particles (d) Industrial discharges
- 36. Chlorofluorocarbon releases _____ harmful to ozone:**
 (a) Free radicals (b) -Ve ions
 (c) +Ve ions (d) All
- 37. Increasing skin cancer and high mutation rate are due to:**
 (a) Acid rain (b) Ozone depletion
 (c) CO (d) Smog
- 38. Ozone hole is largest over:**
 (a) Europe (b) Antarctica
 (c) Asia (d) Africa
- 39. Ozone hole refers to:**
 (a) Physical hole in ozone layers
 (b) Reduction in thickness of ozone layer in stratosphere
 (c) Reduction of thickness of ozone in troposphere
 (d) Increase concentration of ozone
- 40. Environmental pollution affects:**
 (a) Biotic components
 (b) Plants only
 (c) Man only
 (d) Biotic and abiotic components of environment
- 41. Water is often treated with chlorine to:**
 (a) Increase oxygen content (b) Kill germs
 (c) Remove hardness (d) Remove suspended particles
- 42. Result of ozone hole is**
 (a) Greenhouse effect (b) Global warming
 (c) Acid rain (d) UV rays reach the earth
- 43. Co-ordination number of Fe in $[\text{Fe}(\text{CN})_6]^{4-}$:**
 (a) 4 (b) 2
 (c) 6 (d) -4
- 44. Disinfection of water by chlorine is done by the production of:**
 (a) NH_2Cl (b) NCl_3 (c) HOCl (d) NHCl_2
- 45. The residence time of NO in atmosphere is: (SGD 2010)**
 (a) 30 minutes (b) one day (c) Three days (d) Four days
- 46. In purification of potable water the coagulant used is: (BWP 11, LHR 13)**
 (a) Nickle sulphate (b) Copper sulphate
 (c) Barrium sulphate (d) Alum
- 47. Atmosphere contains carbon dioxide:**
 (a) 0.01% (b) 0.02% (c) 0.03% (d) None
- 48. Biochemical oxygen demand is the capacity of organic matter in natural water to consume oxygen with in a period of: (RWP 2008)**
 (a) 3 days (b) 4 days (c) 5 days (d) 6 days
- 49. Half of the mass of the atmosphere is concentrated in lower: (RWP 2009)**
 (a) 4.6 Km (b) 5.6 Km (c) 3.6 Km (d) 15 Km
- 50. Lithosphere extends in Earth up to the depth of: (RWP 2009)**
 (a) 50 Km (b) 100 Km (c) 150 Km (d) 30 Km
- 51. Chlorofluorocarbons play an effective role in removing O_3 in the:**
 (a) Troposphere (b) Stratosphere (c) Polar region (d) Equator

52. Lithosphere is mainly made up of 11 elements, the element found in highest percentage is: (RWP 11, BWP 10)
 (a) Sodium (b) Calcium (c) Carbon (d) Silicone
53. Which one of the following is not the affect of acid rain? (MTN 2008)
 (a) It increases the percentage of CO₂ in the atmosphere
 (b) It leaches metal like aluminum, mercury and lead from soil
 (c) It damages the buildings
 (d) It decreases the pH of natural
54. How much Earth's water is present in Oceans: (MTN 2008)
 (a) 97% (b) 87% (c) 77% (d) 67%
55. Detergent greatly affects: (MTN 2009)
 (a) Aquatic life (b) modern life
 (c) Terrestrial life (d) plant's life
56. The Ozone layer is:
 (a) 25-28 Km high (b) 26-29 Km high
 (c) 24-27 Km high (d) 20-28 Km high
57. The region of earth capable of supporting life is called: (BWP 2008)
 (a) Atmosphere (b) Biosphere
 (c) Lithosphere (d) Hydrosphere
58. The decrease in ozone concentration in overhead atmosphere is occurring due to human activity. Half of the ozone over Antarctica has been depleted up to the year:
 (a) 1960 (b) 1970
 (c) 1980 (d) 1990
59. Component of environment which consists of all water bodies is: (DGK 2010)
 (a) Biosphere (b) Hydrosphere
 (c) Lithosphere (d) Atmosphere
60. Newspaper can be recycled again and again for how many times? (LHR 12,15)
 (a) 2 (b) 3 (c) 4 (d) 5
61. Which one is secondary pollutant?
 (a) SO₂ (b) H₂CO₃ (c) CO (d) CO₂
62. Which one is most toxic? (LHR 2015)
 (a) SO₂ (b) NO₂ (c) CO (d) CO₂
63. The pH of unpolluted rain water should be: (LHR 2014)
 (a) 5.00 (b) 5.60 (c) 6.50 (d) 7.00

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
c	c	c	a	a	b	d	d	B	a
11	12	13	14	15	16	17	18	19	20
b	a	b	c	c	a	b	b	d	a
21	22	23	24	25	26	27	28	29	30
a	d	b	c	d	a	b	a	b	b
31	32	33	34	35	36	37	38	39	40
c	c	a	c	d	a	b	b	b	d
41	42	43	44	45	46	47	48	49	50
b	d	c	c	d	d	c	c	b	b
51	52	53	54	55	56	57	58	59	60
c	d	a	a	a	a	b	c	b	d
61	62	63							
b	c	b							