

CHAPTER 1

PERIODIC CLASSIFICATION OF ELEMENTS AND PERIODICITY

MULTIPLE CHOICE QUESTIONS

- 7th period of the periodic table contains normal elements:
(a) 2 (b) 3
(c) 4 (d) 8
- Periodic table has been divided into four blocks, which blocks contain highest elements:
(a) s (b) p
(c) d (d) f
- The division of elements into blocks in the modern periodic table is based on:
(a) Shell (b) Sub-shell
(c) Orbital (d) All
- Keeping in view the size of atoms, which order is the correct one:
(a) $\text{Mg} > \text{Sr}$ (b) $\text{Ba} > \text{Mg}$
(c) $\text{Lu} > \text{Ce}$ (d) $\text{Cl} > \text{I}$
- Mosley concluded by the X-ray studies of the elements that physical and chemical properties of elements depend upon:
(a) Atomic mass (b) Atomic no.
(c) Mass no. (d) All
- Which one of the following is not ionic hydride:
(a) CsH (b) LiH
(c) HCl (d) NaH

7. The element with highest first ionization energy is:
- (a) B (b) C
(c) O (d) N
8. Mark the correct statement:
- (a) Na^+ is smaller than Na (b) Na^+ is larger than Na
(c) Cl^- is smaller than Cl (d) Cl^- ion and Cl are equal
9. The element with atomic number 9 is closest in chemical properties with element of atomic-number:
- (a) 27 (b) 11
(c) 17 (d) 8
10. Period six in periodic table contain which “block” elements:
- (a) s, p (b) s, p, d
(c) s, p, f (d) s, p, d, f
11. Who introduced the zero group:
- (a) Lothar Mayer (b) Mendeleev
(c) Ramsay (d) Mosley
12. Elements of group II-B are called:
- (a) Representative elements (b) Transition elements
(c) Non-typical transition elements (d) Coinage metal group
13. The elements with lowest M. Pt:
- (a) Be (b) Mg
(c) Cd (d) Cr
14. Which of the following sets of atoms are arranged in order of decreasing electronegativity?
- (a) N, O, F (b) Si, P, S
(c) F, O, N (d) S, Si, P
15. When hydrogen loses its electron to form H^+ ion then it resemble:
- (a) Transition metals (b) Halogen
(c) Alkali metals (d) Noble gases

16. Which of the halides show bridge type structure:
(a) NaCl (b) AlCl₃
(c) CCl₄ (d) H₂O
17. Which element of the following shows max. oxidation state:
(a) P (b) S
(c) Mn (d) Cr
18. M.Pt is highest for the elements of group:
(a) IA (b) IIA
(c) IIIA (d) IVA
19. Amphoteric oxide is formed by:
(a) Ca (b) Fe
(c) Cu (d) Zn
20. In the long form of the periodic table, the most electropositive elements occupy:
(a) Bottom right position (b) Bottom left position
(c) Top right position (d) Top left position

answers

1.	(a)	2.	(c)	3.	(b)	4.	(b)	5.	(b)
6.	(c)	7.	(d)	8.	(a)	9.	(c)	10.	(d)
11.	(d)	12.	(c)	13.	(b)	14.	(c)	15.	(c)
16.	(b)	17.	(c)	18.	(d)	19.	(d)	20.	(b)

CHAPTER 2

s-BLOCK ELEMENTS

MULTIPLE CHOICE QUESTIONS

- Which one of the following is not an alkali metals:
(a) Fr (b) Cs
(c) Rb (d) Ra
- Down's cell is used to prepare:
(a) Na_2CO_3 (b) NaHCO_3
(c) Na (d) NaOH
- Chile saltpeter has the chemical formula:
(a) NaNO_3 (b) KNO_3
(c) $\text{Na}_2\text{B}_4\text{O}_7$ (d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
- Which ion will have the maximum value of heat of hydration:
(a) Na^+ (b) Cs^+
(c) Ba^{+2} (d) Mg^{+2}
- Beryllium metal is as hard as:
(a) Fe (b) Cu
(c) Zn (d) Diamond
- One of the following alkali metals is the most reactive which is that:
(a) Cs (b) K
(c) Na (d) Li
- Which of the following does not give flame test:
(a) Zn (b) Ba
(c) Sr (d) Ca

8. Sodium metal cannot be stored in:
- (a) Toluene (b) Alcohol
(c) Benzene (d) Kerosene oil
9. Dolomite is a carbonate of:
- (a) Ca and Ba (b) Mg and Al
(c) Ca and Mg (d) Na
10. Which one of the following configurations corresponds to an alkaline earth metals:
- (a) $[\text{Ar}] 3d^{10} 4s^2$ (b) $[\text{Ne}] 3d^2 3p^2$
(c) $[\text{Ar}] 4s^2$ (d) $[\text{Ar}] 3d^{10} 4s^1$
11. Dead burnt gypsum is:
- (a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (b) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$
(c) CaSO_4 (d) $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
12. When some water is added to plaster of Paris, it becomes hard and expansion in volume how much:
- (a) 1% (b) 10%
(c) 4% (d) 2%
13. Which of the following compound is formed when Na burn in excess of air:
- (a) NaO_2 (b) Na_2O_2
(c) Na_2O (d) Na_2O_3
14. Chemical formula of slaked lime is:
- (a) CaCO_3 (b) $\text{Ca}(\text{OH})_2 \cdot \text{H}_2\text{O}$
(c) $\text{Ca}(\text{OH})_2$ (d) CaSO_4
15. Which of the following is not a function of sulphur:
- (a) Enlarged root system in plants (b) Chlorophyll development in leaves
(c) Good yield of crops (d) Control of pH of soil
16. Which is produced at the cathode during the electrolysis of brine in Nelson's cell:
- (a) H_2 (b) Na
(c) Cl_2 (d) O_2

17. Which of the following elements can produce H_2 gas when treated with sodium hydroxide:
(a) Be (b) Mg
(c) Ca (d) Sr
18. The operating temp of Down's cell is:
(a) $800^\circ C$ (b) $600^\circ C$
(c) $1800^\circ C$ (d) $900^\circ C$
19. $CaMg_3(SiO_3)_4$ is the composition of:
(a) Dolomite (b) Gypsum
(c) Calcite (d) Asbestos
20. Halite is chemical name of:
(a) KCl (b) NaCl
(c) $MgCl_2$ (d) $SrCl_2$

answers

1.	(d)	2.	(c)	3.	(a)	4.	(d)	5.	(a)
6.	(a)	7.	(a)	8.	(b)	9.	(c)	10.	(c)
11.	(c)	12.	(a)	13.	(b)	14.	(c)	15.	(d)
16.	(a)	17.	(a)	18.	(b)	19.	(d)	20.	(b)

CHAPTER 3

GROUP IIIA AND GROUP IVA ELEMENTS

MULTIPLE CHOICE QUESTIONS

- Which metal is used in thermite process because of its activity:
(a) Fe (b) Cu
(c) Al (d) Zn
- Aluminum oxide is:
(a) Acidic (b) Basic
(c) Amphotric (d) None of these
- Which element form an ion with change +3:
(a) Be (b) Al
(c) C (d) Si
- Which of the following element is not present abundantly in earth's crust:
(a) Si (b) Al
(c) Na (d) O
- Which of the following radicals give blue colour (in cold and hot state) in oxidizing flame when subjected to Borax Bead test:
(a) Cu^{+2} (b) Co^{+2}
(c) Cr^{+3} (d) Ni^{+2}
- Sulphur is not present in:
(a) Onion (b) Garlic
(c) Egg (d) Fat
- Which is the formula of clay:
(a) $\text{Al}_2\text{O}_3 \cdot \text{SiF}_4$ (b) Al_2O_3
(c) $\text{Na}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ (d) $\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$

8. **BF₃ acts as Lewis acid because it behaves as:**
(a) Free radical (b) Cationic specie
(c) Electrophile (d) Nucleophile
9. **Which of the following gas will turns lime water milky:**
(a) Cl₂ (b) NO₂
(c) CO (d) CO₂
10. **Elements which exhibits maximum catenation property:**
(a) C (b) Pb₃O₄
(c) Ge (d) PbO₂
11. **Chrome yellow is:**
(a) PbMoO₄ (b) K₂Cr₂O₇
(c) PbCrO₄ (d) K₂CrO₄
12. **Which one of the following is the formula of litharge:**
(a) PbO (b) PbO₂
(c) Pb₃O₄ (d) Pb₂O₃
13. **A gas which burn with blue flame is:**
(a) CO₂ (b) N₂
(c) CO (d) NO
14. **Which compound of silicon used as filler in soap to make it heavy:**
(a) SiO₂ (b) Na₂SiO₃
(c) H₂SiO₃ (d) Silicones
15. **Pb₃O₄ has chemical name of:**
(a) Litharge (b) Massicot
(c) Sandhur (d) Halite
16. **Stable shape in which PbCrO₄ exist:**
(a) Triclinic (b) Monoclinic
(c) Rhomleric (d) None of these
17. **Chief ore of Al is:**
(a) Na₃AlF₆ (b) Al₂O₃ . 2H₂O
(c) Al₂O₃ (d) Al₂O₃ . H₂O

18. Tincal is a mineral of:

- (a) Al ~~(b) B~~
(c) Si (d) C

19. What is the nature of solution of Borax:

- (a) Neutral ~~(b) Alkaline~~
(c) Acidic (d) Corrosive

20. Which of the following is the correct number of lone-pair with oxygen in CO:

- ~~(a) 1~~ (b) 2
(c) 3 (d) 4

answers

1.	(c)	2.	(c)	3.	(b)	4.	(c)	5.	(b)
6.	(d)	7.	(d)	8.	(c)	9.	(d)	10.	(a)
11.	(c)	12.	(a)	13.	(c)	14.	(b)	15.	(c)
16.	(b)	17.	(b)	18.	(b)	19.	(b)	20.	(a)

GROUP VA AND GROUP VIA ELEMENTS

8. When red phosphorous is heated with HNO_3 it forms:
- ~~(a)~~ H_3PO_4 (b) HPO_2
(c) H_2PO_3 (d) H_3PO_3
9. Which of the following is used at the tips of match stick:
- ~~(a)~~ $\text{K}_2\text{Cr}_2\text{O}_7 + \text{S} + \text{White P}$ (b) $\text{K}_2\text{Cr}_2\text{O}_7 + \text{K} + \text{S}$
(c) S and K (d) Sb_2S_3
10. What is the number of electrons present in the valence shell of P in PCl_3 :
- (a) 4 (b) 6
~~(c)~~ 8 (d) 2
11. Phosphorous shows oxidation state (+3) in which of the following:
- (a) $\text{H}_4\text{P}_2\text{O}_7$ (b) PO_4^{-3}
~~(c)~~ H_3PO_3 (d) H_3PO_4
12. Which element is the most abundant in the earth's crust:
- (a) Fe ~~(b)~~ O
(c) Si (d) C
13. Which catalyst is used in contact process:
- (a) Fe_2O_3 ~~(b)~~ V_2O_5
(c) SO_3 (d) Ag_2O
14. The brown gas formed when metal reduces HNO_3 is:
- (a) N_2O_5 (b) N_2O_3
~~(c)~~ NO_2 (d) NO
15. Which of the following specie has the maximum number of unpaired electrons:
- (a) O_2^{-1} (b) O_2^{+2}
(c) O_2^{-2} ~~(d)~~ O_2
16. The contact process for the manufacturing of H_2SO_4 was developed by:
- (a) Jabir-Bin-Hayan ~~(b)~~ Knetsch
(c) Al-Khwarzmi (d) Mendleeve
17. In which compound of nitrogen, the oxidation state of N is (+1):
- ~~(a)~~ N_2O (b) NO
(c) NO_2 (d) N_2O_4

18. FeSO_4 forms brown ring with:

- (a) N_2O_4 (b) ~~NO~~
(c) NO_2 (d) None of these

19. "Lead" in lead pencil is:

- (a) Bone black (b) ~~Graphite and clay~~
(c) Lead oxide (d) Lead peroxide

20. Formula of Gibbsite is:

- (a) Al_2O_3 (b) $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$
(c) $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ (d) ~~$\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$~~

answers

1.	(b)	2.	(c)	3.	(d)	4.	(b)	5.	(b)
6.	(a)	7.	(c)	8.	(a)	9.	(a)	10.	(c)
11.	(c)	12.	(b)	13.	(b)	14.	(c)	15.	(d)
16.	(b)	17.	(a)	18.	(b)	19.	(b)	20.	(d)

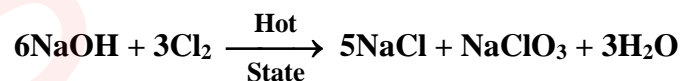
CHAPTER 5

THE HALOGENS AND THE NOBLE GASES

MULTIPLE CHOICE QUESTIONS

- Which of the following hydrogen halide is the weakest acid in solution:
 (a) ~~HF~~ (b) HBr
 (c) HI (d) HCl
- Hydrogen bonding is the strongest among the molecules of:
 (a) HCl (b) ~~HF~~
 (c) HI (d) HBr
- Which of the following halogen is in solid form at room temperature:
 (a) ~~I₂~~ (b) F₂
 (c) Br₂ (d) Cl₂
- Which of the halogens is most easily reduced:
 (a) I₂ (b) Br₂
 (c) ~~F₂~~ (d) Cl₂
- What is the reason for lowest bond dissociation energy of F₂ among the halogens:
 (a) Low I.E (b) Absence of d-orbitals
 (c) Low lattice energy of salts (d) ~~Repulsion among non-bonding electrons~~
- Which silver salt is sparingly soluble in H₂O:
 (a) AgF (b) AgBr
 (c) ~~AgCl~~ (d) AgI
- All the halogens are coloured. The intensity of the colour depends on:
 (a) Valence electron (b) ~~Atomic number~~
 (c) Atomic mass (d) None of these
- Which of the following is the strongest acid:
 (a) HClO (b) HClO₂
 (c) ~~HClO₄~~ (d) HClO₃

9. Oxidation state of Ca in $\text{Ca}(\text{OCl})\text{Cl}$ (bleaching powder) is:
- (a) +3 (b) +4
(c) +2 (d) +1
10. Which of the following has greater volatility:
- (a) CH_3F (b) CH_3Cl
(c) CH_3Br (d) CH_3I
11. Among fluorides of xenon which is a mild fluorinating agent:
- (a) XeF_2 (b) XeF_4
(c) XeF_6 (d) All
12. Which one is used for etching of glass:
- (a) HBr (b) HF
(c) HCl (d) HI
13. Astatine (radioactive element) has a half-life:
- (a) 4 hrs (b) 10 hrs
(c) 8.3 hrs (d) 4.3 hrs
14. Which halogen occurs naturally in positive oxidation state:
- (a) Fluorine (b) Chlorine
(c) Bromine (d) Iodine
15. The anhydride of HClO_4 is:
- (a) ClO (b) ClO_2
(c) ClO_3 (d) Cl_2O_7
16. Bleaching powder is not used for bleaching:
- (a) Cotton (b) Costly fabrics
(c) Linen (d) Paper pulp
17. Consider the following reaction



the type of above reaction is:

- (a) Addition reaction (b) Disproportionation reaction
(c) Displacement reaction (d) Decomposition reaction

18. Cl_2O_7 react with H_2O to form:
 (a) Hypochlorous acid (b) Chloric acid
 (c) Perchloric acid (d) Cl_2 and O_2
19. Halogen used in toothpaste, it builds protecting covering:
 (a) F (b) Cl
 (c) Br (d) I
20. Which of the following react with H_2 in dark:
 (a) F_2 (b) I_2
 (c) Cl_2 (d) Br_2
21. Which of the following is used in radiotherapy:
 (a) Rn (b) Xe
 (c) Kr (d) Ar
22. Who reported the first noble gas:
 (a) Cavendish (b) Frankland
 (c) William Ramsay (d) Rayleigh
23. Which noble gas does not obey octet rule:
 (a) Ne (b) He
 (c) Ar (d) Kr
24. Which is the most polarised noble gas:
 (a) Kr (b) Xe
 (c) He (d) Rn
25. XeF_2 molecule is:
 (a) Tetrahedral (b) Linear
 (c) Pyramidal (d) Trigonal planar

answers

1.	(a)	2.	(b)	3.	(a)	4.	(c)	5.	(d)
6.	(c)	7.	(b)	8.	(c)	9.	(c)	10.	(a)
11.	(a)	12.	(b)	13.	(c)	14.	(d)	15.	(d)
16.	(b)	17.	(b)	18.	(c)	19.	(a)	20.	(a)
21.	(a)	22.	(c)	23.	(b)	24.	(b)	25.	(b)

CHAPTER 6

TRANSITION ELEMENTS

MULTIPLE CHOICE QUESTIONS

- What is formula of haematite:
 - FeS_2
 - FeO_3
 - Fe_2O_3
 - Fe_3O_4
- Which is non-typical transition elements:
 - Cr
 - Mn
 - Zn
 - Fe
- Highest oxidation state of Mn in which compound:
 - K_2MnO_4
 - KMnO_4
 - MnO
 - MnO_2
- The trace metal present in insulin is:
 - Mn
 - Co
 - Fe
 - Zn
- The hybridization of Ni in $[\text{Ni}(\text{CN})_4]^{-2}$ ion is:
 - sp^3
 - dsp^3
 - d^2sp^3
 - dsp^2
- Which of the following cation has maximum unpaired electron:
 - Ni^{+2}
 - Co^{+2}
 - Mn^{+2}
 - Fe^{2+}
- Which is the configuration of Cr:
 - $3\text{d}^4 4\text{s}^2$
 - $3\text{d}^5 4\text{s}^1$
 - $3\text{d}^6 4\text{s}^1$
 - $2\text{d}^1 4\text{s}^2$
- The black image on an exposed and developed photographic film is composed of:
 - Ag
 - Ag_2O
 - AgBr
 - $\text{Ag}[(\text{SrO}_3)_2]^-$

9. The strength of binding energy of transition elements depend upon:
- (a) No. of \bar{e} -pair (b) No. of unpaired \bar{e}
 (c) No. of neutron (d) No. of proton
10. Mild steel contain carbon:
- (a) 0.1 – 0.2% (b) 0.2 – 0.7%
 (c) 0.1 – 1.0% (d) 17
11. To prevent corrosion, iron pipes carrying drinking water are covered with Zn by process called:
- (a) Alloy formation (b) Electroplating
 (c) Galvanizing (d) Soldering
12. No. of \bar{e} -pairs accepted by the central atom in a transition metal complex is called:
- (a) Co-ordination sphere (b) Co-ordination complex
 (c) Co-ordination number (d) Chelate
13. Group VIB of transition elements contains:
- (a) Zn, Cd, Hg (b) Fe, Ru, Os
 (c) Cr, Mo, W (d) Mn, Te, Re
14. Which of the following is a typical transition metal:
- (a) Sc (b) Y
 (c) Ra (d) Co
15. Co-ordination number of Pt in $[\text{Pt Cl}(\text{NO}_2)(\text{NH}_3)_4]^{2-}$ is:
- (a) 2 (b) 4
 (c) 1 (d) 6

answers

1.	(c)	2.	(c)	3.	(b)	4.	(d)	5.	(d)
6.	(c)	7.	(b)	8.	(a)	9.	(b)	10.	(a)
11.	(c)	12.	(c)	13.	(c)	14.	(d)	15.	(d)

CHAPTER 7

FUNDAMENTAL PRINCIPLES OF ORGANIC CHEMISTRY

MULTIPLE CHOICE QUESTIONS

- The state of hybridization of carbon atom in methane is:
(a) sp^3 (b) sp^2
(c) sp (d) dsp^2
- The chemist who synthesized urea from ammonium cyanate was:
(a) Berzelius (b) Kolbe
(c) Wholer (d) Lavoisier
- Which set of hybrid orbitals has planar triangular shape:
(a) sp^3 (b) sp
(c) sp^2 (d) dsp^2
- The reaction $C_8H_{18} \xrightarrow{\Delta} C_3H_6 + \text{Fragments}$ is:
(a) Catalytic oxidation (b) Isomerization
(c) Synthesis (d) Cracking
- The octane number is 100% in petroleum:
(a) Neo-octane (b) n-Hexane
(c) Neo-pentane (d) Iso-octane
- Concept of octane number was introduced by:
(a) Kekule (b) Edgar
(c) Wholer (d) Dalton
- Which of the following form of coal has maximum %age of carbon:
(a) Peat (b) Bituminous
(c) Sub-bituminous (d) Anthracite

8. Which of the following is the use of light naptha:
- (a) ~~Non-polar solvent~~ (b) Lubricant
(c) Roofing (d) Polar solute
9. Carbon atom of HCHO (methanal, formaldehyde) is:
- (a) sp hybridized (b) ~~sp^2 hybridized~~
(c) sp^3 hybridized (d) Not hybridized
10. A double bond consist of:
- (a) Two sigma bonds (b) ~~One sigma and one pi bond~~
(c) One sigma and two pi bond (d) Two pi bonds
11. Alkanoic acid is another name of:
- (a) Aldehyde (b) Ketones
(c) ~~Carboxylic acid~~ (d) Alcohols
12. An isomer of ethanol is:
- (a) ~~Dimethyl ether~~ (b) Diethyl ether
(c) Ethylene glycol (d) Methanol
13. Ethers shows the phenomenon of:
- (a) Position isomerism (b) Functional group isomerism
(c) ~~Metamerism~~ (d) Cis-trans isomerism
14. Isomerism exhibited by ethanol and dimethyl ether is:
- (a) Position isomerism (b) Metamerism
(c) ~~Functional group isomerism~~ (d) Chain isomerism
15. Which one of the following does not show geometric isomerism:
- (a) $ClHC = CHCl$ (b) $H_3C - HC = CHCH_3$
(c) ~~$H_2C = CHCl$~~ (d) $BrClC = CClBr$
16. In t-butyl alcohol, the tertiary carbon is bonded to:
- (a) Two H-atoms (b) Three H-atoms
(c) One H-atom (d) ~~No H-atom~~
17. Which one is the functional group of esters:
- (a) $\begin{array}{c} O \\ || \\ -C - X \end{array}$ (b) $\begin{array}{c} O \\ || \\ -C - OH \end{array}$
(c) ~~$\begin{array}{c} O \\ || \\ -C - OR \end{array}$~~ (d) $\begin{array}{c} O \\ || \\ -C - H \end{array}$

18. Which of the following has zero dipole moment:
(a) 2-methyl-1-propene (b) 1-butene
(c) Trans-2-butene (d) Cis-2-butene
19. Fractional distillation of petroleum yields only about _____ of gasoline.
(a) 40% (b) 20%
(c) 70% (d) 10%
20. Which of the following compounds will exhibit cis-trans (isomerism):
(a) Butanal (b) 2-butyne
(c) 2-butanol (d) 2-butene

answers

1.	(a)	2.	(c)	3.	(c)	4.	(d)	5.	(d)
6.	(b)	7.	(d)	8.	(a)	9.	(b)	10.	(b)
11.	(c)	12.	(a)	13.	(c)	14.	(c)	15.	(c)
16.	(d)	17.	(c)	18.	(c)	19.	(b)	20.	(d)

CHAPTER 8

ALIPHATIC HYDROCARBONS

MULTIPLE CHOICE QUESTIONS

- Preparation of vegetable ghee involves:**
(a) Halogenation (b) ☒ Hydrogenation
(c) Hydroxylation (d) Dehydrogenation
- Which type of reactions are given by alkanes:**
(a) Polymerization (b) Elimination
(c) Addition ☒ (d) Substitution
- The most reactive hydrocarbon is:**
☒ (a) Ethene (b) Acetylene
(c) Heptane (d) Ethane
- Formula of chloroform is:**
(a) CH_3Cl (b) CCl_4
(c) CH_2Cl_2 ☒ (d) CHCl_3
- Cycloalkanes and Alkenes contain which general formula:**
(a) $\text{C}_n\text{H}_{2n+2}$ ☒ (b) C_nH_{2n}
(c) $\text{C}_n\text{H}_{2n-2}$ (d) C_nH_n
- Which of the following is not alicyclic:**
(a) Cyclohexene (b) Cyclobutane
☒ (c) Toluene (d) Cyclopentene
- Unsaturated nature of alkene can be detected by:**
(a) Decolorization of red Br_2 water in CCl_4
(b) Decolorization of pink colour of KMnO_4 solution
(c) Ozonolysis
☒ (d) All

8. The addition of unsymmetrical reagent to an unsymmetrical alkene is in accordance with the rule:
- ~~(a)~~ Hund's rule (b) Markovnikov's rule
(c) Pauli's exclusion principle (d) Aufbau principle
9. Vicinal dihalides on treatment with Zn-dust give:
- (a) Alkenes ~~(b)~~ Alkynes
(c) Alkanes (d) All of them
10. Formula of Lindlar's catalyst is:
- (a) $\text{Pb}(\text{BaSO}_4)$ / Quinoline (b) $\text{Ba}(\text{PbSO}_4)$ / Quinoline
(c) $\text{Pd}(\text{BaSO}_3)$ / Quinoline ~~(d)~~ $\text{Pd}(\text{BaSO}_4)$ / Quinoline
11. Synthetic rubber is made by the polymerization of:
- (a) Chloroform (b) Acetylene
(c) Divinyl acetylene ~~(d)~~ Chloroprene
12. Ammoniacal solution of silver nitrate reacts with:
- (a) 2-pentyne (b) Ethene
(c) 2-butyne ~~(d)~~ Ethyne
13. Polymerization of acetylene forms:
- (a) Propane (b) Butane
~~(c)~~ Benzene (d) Naphthalene
14. The number of xylene isomers is:
- (a) 2 ~~(b)~~ 3
(c) 4 (d) 5
15. Number of acidic hydrogens present in 1-butyne is:
- ~~(a)~~ 1 (b) 2
(c) 3 (d) 4
16. Chemically Baeyer's reagent is:
- ~~(a)~~ 1% alkaline KMnO_4 (b) 1% acidic KMnO_4
(c) 15% alkaline KMnO_4 (d) 2% alkaline KMnO_4
17. Which of the following gases is used for artificial ripening of fruits:
- (a) Ethene (b) Ethyne
(c) Methane ~~(d)~~ Both (a) and (b)

18. Hydroxylation of alkene can be carried out by:
(a) ~~Alkaline~~ KMnO_4 (b) O_3
(c) H_2SO_4 (d) $\text{K}_2\text{Cr}_2\text{O}_7$
19. Acetylene has a characteristic smell resembling that of:
(a) Rotten egg (b) ~~Garlic~~
(c) Spicy like (d) None of the above
20. When ethylene ozonide is treated with Zn-dust we get:
(a) Ethanal (b) ~~Methanal~~
(c) Methanol (d) Ethanol

answers

1.	(b)	2.	(d)	3.	(a)	4.	(d)	5.	(b)
6.	(c)	7.	(d)	8.	(b)	9.	(a)	10.	(d)
11.	(d)	12.	(d)	13.	(c)	14.	(b)	15.	(a)
16.	(a)	17.	(a, b)	18.	(a)	19.	(b)	20.	(b)

CHAPTER 9

AROMATIC HYDROCARBONS

MULTIPLE CHOICE QUESTIONS

- Which of the following acid can be used as a catalyst in Friedel Craft's reaction:

(a) AlCl_3	(b) HNO_3
(c) BeCl_2	(d) NaCl
- During nitration of benzene, the active nitrating agent is:

(a) NO_3	(b) NO_2^+
(c) NO_2^-	(d) HNO_3
- The electrophile in aromatic sulphonation is:

(a) H_2SO_4	(b) HSO_4^-
(c) SO_3^+	(d) SO_3
- Hydrogen to carbon ratio in aromatic hydrocarbons is:

(a) Low	(b) High
(c) Equal	(d) None
- The second substitution in benzene ring would give rise isomeric products:

(a) One	(b) Two
<u>(c)</u> Three	(d) Four
- Molecular mass of benzene is determined by:

(a) Vapour density method	(b) X-ray diffraction
(c) Elemental analysis	(d) Degradation method
- C – H bond lengths in benzene are:

(a) 0.99 \AA	(b) 1.09 \AA
(c) 1.12 \AA	(d) 1.397 \AA

8. Each carbon in benzene ring is _____ hybridized:
(a) sp (b) ~~sp^2~~
(c) sp^3 (d) None of these
9. On hydrogenation benzene liberates energy:
(a) 358.5 kJ/mole (b) 119 kJ-mol⁻¹
~~(c) 208 kJ-mol⁻¹~~ (d) 150.5 kJ-mol⁻¹
10. The benzene ring is oxidized to maleic anhydride when strongly heated with:
(a) Ni/200°C ~~(b) V_2O_5 /450°C~~
(c) $AlCl_3$ /150°C (d) Sunlight
11. Main source of aromatic compound is:
(a) Petroleum ~~(b) Coal-tar~~
(c) Living organism (d) Dead marine animals
12. When acetylene is heated at 300°C in Cu-tube, the product obtained is:
~~(a) Benzene~~ (b) Thiophene
(c) Divinyl acetylene (d) Xylene
13. Which one of the following species is ortho and para director:
(a) CHO (b) $-SO_3H$
(c) $-NO_2$ ~~(d) Cl~~
14. The carbon-carbon bond distance in benzene:
(a) 1.54°A (b) 1.34°A
(c) 1.2°A ~~(d) 1.39°A~~
15. In toluene synthesis by Friedel Craft, the reactants in addition to anhydrous $AlCl_3$ are:
(a) $C_6H_6 + CH_4$ (b) C_6H_5Cl
~~(c) $C_6H_6 + CH_3Cl$~~ (d) $C_6H_5Cl + CH_4$
16. Benzophenone is also known as:
(a) Biphenyl (b) Dimethyl Ketone
~~(c) Diphenyl Ketone~~ (d) Methylphenyl Ketone
17. The no. of possible isomers of xylene are:
(a) 2 ~~(b) 3~~
(c) 4 (d) 5

18. The molecular formula of naphthalene is:
~~(a)~~ $C_{10}H_8$ (b) $C_{10}H_{10}$
(c) $C_{10}H_{12}$ (d) $C_{12}H_{12}$
19. Chlorine react with benzene in the presence of sunlight to give:
(a) Chlorobenzene (b) Benzoyl chloride
(c) Ortho-para dichlorobenzene ~~(d)~~ Hexachlorobenzene
20. Effect of substituent on benzene ring is due to:
(a) Resonance (b) Inductive effect
~~(c)~~ Both (a) and (b) (d) Unpredictable
21. In which of the following cases, the benzene rings are isolated:
(a) Naphthalene (b) Phenanthrene
(c) Anthracene ~~(d)~~ Triphenylmethane
22. Benzene is stable than ethene because it has:
(a) More π -bonds (b) Localized π -electrons
~~(c)~~ Delocalized π -electrons (d) More σ -bonds
23. Which of the following is ortho and para directing group:
~~(a)~~ $-OH$ (b) $-OCH_3$
(c) $-CHO$ (d) $-NH_2$
24. Among the following compounds which can be readily sulphonated:
~~(a)~~ Phenol (b) Benzene
(c) Nitrobenzene (d) Chlorobenzene
25. Structure of benzene is resonance hybrid of all _____ structures:
(a) 3 (b) 4
~~(c)~~ 5 (d) 6
26. Aromatic hydrocarbons are derivatives of:
(a) Paraffins (b) Alkene
~~(c)~~ Benzene (d) Cyclohexane
27. Which of the following explains the structure of benzene:
(a) Atomic orbital treatment of benzene
(b) Resonance method
~~(c)~~ Both (a) and (b)
(d) None

28. The conversion of n-hexane into benzene by heating in the presence of ($\text{Al}_2\text{O}_3 + \text{SiO}_2 + \text{Cr}_2\text{O}_3$) is called:
- (a) Isomerization ~~(b)~~ Aromatization
(c) Dealkylation (d) Rearrangement
29. Which of the following is called benzyl radical:
- (a) $\text{C}_6\text{H}_5 -$ (b) $\text{C}_6\text{H}_5 - \text{CH}$
~~(c)~~ $\text{C}_6\text{H}_5 - \text{CH}_2 -$ (d) $\text{C}_6\text{H}_5 - \text{C} -$
30. Toluene can be converted to benzoic acid in the presence of:
- (a) dil. NaOH (b) dil. HNO_3
(c) Conc. HNO_3 ~~(d)~~ Acidified KMnO_4
31. Cyclic structure of benzene was proposed by:
- (a) Dewar (b) Faraday
(c) Down ~~(d)~~ Kekule
32. Benzene does not undergo:
- (a) Addition (b) Substitution
~~(c)~~ Polymerization (d) Aromatization

answers

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

CHAPTER 10

ALKYL HALIDE

MULTIPLE CHOICE QUESTIONS

- Which of the following alkyl halide is the most reactive towards the attacking nucleophile:
(a) CH_3F (b) CH_3Cl
(c) CH_3Br (d) CH_3I
- Which of the following is not nucleophile:
(a) H_2O (b) H_2S
(c) BF_3 (d) NH_3
- Carbocation is a/an:
(a) Electrophile (b) Nucleophile
(c) Free radical (d) Group of atoms
- 1-bromobutane on reaction with alcoholic potassium hydroxide gives:
(a) 1-butanol (b) 1-butene
(c) 2-butene (d) 1-butyne
- $\text{S}_{\text{N}}2$ reaction can be best carried out with:
(a) Primary alkyl halide (b) Secondary alkyl
(c) Tertiary alkyl halide (d) All of above
- For which mechanism the first step involved is the same:
(a) E_1 and E_2 (b) E_2 and $\text{S}_{\text{N}}2$
(c) $\text{S}_{\text{N}}1$ and E_2 (d) E_1 and $\text{S}_{\text{N}}1$
- In the transition state of $\text{S}_{\text{N}}2$ mechanism reaction with alkyl halides, which of the following orbital hybridization is involved:
(a) sp^3 (b) sp^2
(c) sp (d) dsp^2

8. Which of the following factors does not affect the S_N1 rate is:
- ☒ (a) Nucleophilicity of the attacking nucleophile
 - (b) Stability of the carbonium ion
 - (c) Solvent system
 - (d) The nature of leaving group
9. In β -elimination reaction, nucleophile attacks on:
- (a) α -hydrogen
 - ☒ (b) β -hydrogen
 - (c) Hydrogen
 - (d) α -carbon
10. The substances which donate a pair of electron to electrophile are called:
- (a) Electrophile
 - ☒ (b) Nucleophile
 - (c) Lewis acid
 - (d) Dibasic acid
11. Which one of the following will be present at the position of letter B
- $$\text{C}_2\text{H}_5\text{Br} \xrightarrow[\text{Alcohol}]{\text{KOH}} \text{A} \xrightarrow{\text{H}_2/\text{Pt}} \text{B}$$
- (a) Ethyl alcohol
 - (b) Acetaldehyde
 - (c) Ethene
 - ☒ (d) Ethane
12. In unimolecular reactions, the reaction completes in:
- (a) One step
 - ☒ (b) Two steps
 - (c) Three steps
 - (d) None of these
13. Grignard's reagent reacts to form alkane with:
- (a) Water
 - (b) Ammonia
 - (c) Ethanol
 - ☒ (d) All of these
14. Grignard's reagents produce primary alcohol with:
- (a) Formaldehyde
 - (b) Epoxide
 - (c) Acetaldehyde
 - ☒ (d) Both (a) and (b)
15. Carbanions are:
- (a) Electrophile
 - ☒ (b) Nucleophile
 - (c) Free radical
 - (d) Group of atoms
16. Which substance is used to convert alcohol to alkyl halide:
- (a) SOCl_2
 - (b) PCl_3
 - (c) $\text{HCl} + \text{ZnCl}_2$
 - ☒ (d) All of these
17. Ethyl bromide when reduced with nascent hydrogen the product will be:
- (a) Ethyl alcohol
 - ☒ (b) Ethane
 - (c) Butane
 - (d) Propane

18. When bromomethane is hydrolyzed by aqueous NaOH solution which ion brings about the first stage of substitution:
 (a) Na^+ (b) OH^-
 (c) Anyone ~~(d) No reaction~~
19. In primary alkyl halide the halogen atom is attached to a carbon which is further attached to how many carbon atoms:
~~(a) One~~ (b) Two
 (c) Three (d) Nil
20. Which one of the following is not associated with $\text{S}_{\text{N}}2$ mechanism:
 (a) 100% inversion of configuration
 (b) 2nd order kinetics
~~(c) Tertiary alkyl halides~~
 (d) Change of hybridization from sp^3 to sp^2 in transition state
21. Grignard reagent is reactive due to:
 (a) The presence of halogen atom (b) The presence of Mg atom
~~(c) The polarity of C – Mg bond~~ (d) Electrophilic carbon
22. Reaction of $\text{C}_2\text{H}_5\text{MgBr}$ with CO_2 is an example of:
 (a) Electrophilic substitution (b) Nucleophilic substitution
 (c) Electrophilic addition ~~(d) Nucleophilic addition~~
23. Which one of the following is not a nucleophile:
 (a) $\text{CH}_3 - \text{NH}_2$ (b) $\text{CH}_2 = \text{CH}_2$
 (c) OH^- ~~(d) CH_3^+~~
24. Acetic acid can be obtained from CH_3MgI by treatment with:
 (a) H_2O (b) ClNH_2
~~(c) CO_2~~ (d) HCHO

answers

1.	(d)	2.	(c)	3.	(a)	4.	(b)	5.	(a)
6.	(d)	7.	(b)	8.	(a)	9.	(b)	10.	(b)
11.	(d)	12.	(b)	13.	(d)	14.	(d)	15.	(b)
16.	(d)	17.	(b)	18.	(d)	19.	(a)	20.	(c)
21.	(c)	22.	(d)	23.	(d)	24.	(c)		

CHAPTER 11

ALCOHOLS, PHENOLS AND ETHERS

MULTIPLE CHOICE QUESTIONS

- Williamsons synthesis is used for the synthesis of:
 - Phenol
 - Alcohol
 - Ether
 - Aldehyde
- Aldehydes after catalytic reduction change to:
 - P° alcohol
 - S° alcohol
 - T° alcohol
 - P° and S° alcohol
- When ether is protonated, the conjugate acid formed is called:
 - An oxonium ion
 - Carbanion
 - An oxide ion
 - A hydration ion
- Which of the following alcohol is commonly used as anti-freeze:
 - Methanol
 - Ethanol
 - Ethylene glycol
 - All of the above
- Which of the following will have the highest boiling point:
 - Methanal
 - Ethanal
 - Propanal
 - 2-hexanone
- 95% ethanol is called:
 - Absolute alcohol
 - Rectified spirit
 - Methylated spirit
 - Wood spirit
- Which of the following alcohol is used in the perfumes and for flavouring:
 - Methanol
 - Ethanol
 - 1-propanol
 - 1-butanol

8. According to Lewis concept ethers behaves as:
- (a) Acid ~~(b) Base~~
(c) Acid as well as base (d) None of above
9. Which enzyme is not involved in fermentation of starch:
- (a) Diastase (b) Zymase
~~(c) Urease~~ (d) Maltase
10. The hydrolysis of sugar is called:
- (a) Condensation (b) Polymerization
~~(c) Inversion~~ (d) Reduction
11. Which compound shows maximum hydrogen bonding with water:
- (a) C_6H_5OH ~~(b) C_2H_5OH~~
(c) $CH_3 - O - CH_3$ (d) n-hexanol
12. Which statement is incorrect about phenol:
- (a) It is colourless, crystalline poisonous solid
(b) It does not turn blue litmus paper red
~~(c) It liberates CO_2 gas from carbonate~~
(d) Above $65.9^\circ C$ it is miscible wither water
13. Which of the following is the weakest acid:
- (a) Phenol ~~(b) Alcohol~~
(c) Carboxylic acid (d) Water
14. Which inorganic reagent may be used to distinguish between phenol and methanol:
- (a) Alkaline aqueous I_2 (b) Aqueous $NaHCO_3$
~~(c) $K_2Cr_2O_7$ in dil. H_2SO_4~~ (d) Na
15. Phenol is also called:
- (a) Carbonic acid ~~(b) Carbolic acid~~
(c) Carboxylic acid (d) Fatty acid
16. Which of the following give iodoform test:
- (a) CH_3OH ~~(b) C_2H_5OH~~
(c) Methanal (d) 1-propanol

17. Which of the following is more reactive where O – H bonds break:
(a) ~~P° alcohol~~ (b) S° alcohol
(c) T° alcohol (d) Cannot be predicted
18. Which of the following alcohol is least soluble in water:
(a) CH₃OH (b) C₂H₅OH
(c) C₃H₇OH (d) ~~C₄H₉OH~~
19. 100% pure alcohol is called:
(a) Methylated spirit (b) Rectified spirit
(c) Power alcohol (d) ~~Absolute alcohol~~
20. The correct name of H₂C = CH – CH₂ – CH₂ – OH is:
(a) 1-butene-4-ol (b) 2-butene-1-ol
(c) ~~3-butene-1-ol~~ (d) None of these
21. Which of the following is more reactive:
(a) Benzene (b) ~~Phenol~~
(c) Nitrobenzene (d) Benzoic acid
22. Bakelite is thermosetting plastic, it is formed by the polymerization of:
(a) Ethanol and formaldehyde (b) Phenol and ethanol
(c) ~~Phenol and formaldehyde~~ (d) Phenol and acetaldehyde
23. Which of the following compound should have lowest boiling point:
(a) ~~C₂H₆~~ (b) C₂H₅Cl
(c) CH₃ – O – CH₃ (d) C₂H₅OH
24. Ethanol can be converted into ethanoic acid by:
(a) Hydrogenation (b) Fermentation
(c) ~~Oxidation~~ (d) Hydration
25. When 2-pentanol undergoes oxidation the product is:
(a) Pentanol (b) 3-pentanone
(c) ~~2-pentanone~~ (d) Pentanoic acid
26. When ethyl bromide (C₂H₅Br) is heated with Ag₂O in the absence of moisture the product formed is:
(a) Ethanol (b) ~~Diethyl ether~~
(c) Ethanal (d) Ethene

27. Which of the following compound has no unsaturation:
 (a) Methanal (b) Methoxy methane
 (c) Phenol (d) Benzoic acid
28. The conversion of ethanol to ethene is an example of:
 (a) Dehydration (b) Hydration
 (c) Hydrogenation (d) Fermentation
29. Ethanol reacts with sodium metal to liberate:
 (a) CO₂ gas (b) H₂ gas
 (c) CO gas (d) Steam
30. Diethyl ether can be decomposed by heating with:
 (a) HI (b) NaOH
 (c) Water (d) KMnO₄

answers

1.	(c)	2.	(a)	3.	(a)	4.	(c)	5.	(d)
6.	(b)	7.	(d)	8.	(b)	9.	(c)	10.	(c)
11.	(b)	12.	(c)	13.	(b)	14.	(c)	15.	(b)
16.	(b)	17.	(a)	18.	(d)	19.	(d)	20.	(c)
21.	(b)	22.	(c)	23.	(a)	24.	(c)	25.	(c)
26.	(b)	27.	(b)	28.	(a)	29.	(b)	30.	(a)

CHAPTER 12

ALDEHYDES AND KETONES

MULTIPLE CHOICE QUESTIONS

- Mild oxidizing agent among the following is:**
 - $\text{K}_2\text{Cr}_2\text{O}_7$ (acidified)
 - KMnO_4 (alkaline)
 - ~~(c)~~ Ammonical AgNO_3
 - (d) All of above
- $\text{C}=\text{O}$ and $\text{C}=\text{C}$ bonds are differentiated by:**
 - Hybridization of C-atom
 - Planar structures
 - ~~(c)~~ Bond length
 - (d) Undergo addition reaction
- Reactivity of carbonyl compounds is due to:**
 - Electrophilic carbon
 - Less steric hindrance
 - Unsaturation of >C=O
 - ~~(d)~~ All of above
- For the preparation of CH_3CHO from calcium acetate we need:**
 - 2 molecules of $\text{Ca}(\text{CH}_3\text{COO})_2$
 - ~~(b)~~ 1 mole of $\text{Ca}(\text{CH}_3\text{COO})_2$ and 1 molecule of $\text{Ca}(\text{HCOO})_2$
 - 2 molecules of $\text{Ca}(\text{HCOO})_2$
 - (d) None of these
- Which is a mixed ketone:**
 - Acetone
 - Benzophenone
 - Diethyl ketone
 - ~~(d)~~ Acetophenone
- Which of the following can produce ketone:**
 - Sec-alcohol
 - Calcium acetate
 - Propyne
 - ~~(d)~~ All of above

7. Which of the following is resistant to oxidation under normal condition:
- (a) CH_3OH (b) $\text{C}_2\text{H}_5\text{OH}$
(c) CH_3CHO ~~(d) CH_3COCH_3~~
8. Which of the following aldehyde is most reactive:
- ~~(a) HCHO~~ (b) CH_3CHO
(c) $\text{C}_6\text{H}_5\text{CHO}$ (d) All of above
9. Ketones are prepared by the oxidation of:
- (a) P° alcohol ~~(b) S° alcohol~~
(c) T° alcohol (d) None of these
10. Which of the following don't give cannizzare reaction:
- (a) Formaldehyde ~~(b) Acetaldehyde~~
(c) Benzaldehyde (d) None of above
11. Ethanal has ——— sigma bonds:
- (a) 5 ~~(b) 6~~
(c) 7 (d) 8
12. Which of the following compounds is acetophenone:
- ~~(a) $\text{C}_6\text{H}_5\text{COCH}_3$~~ (b) $\text{C}_6\text{H}_5\text{COC}_6\text{H}_5$
(c) CH_3COCH_3 (d) $\text{C}_6\text{H}_5\text{CHO}$
13. Which of the following tests is shown by ketones:
- (a) Fehling solution test (b) Tollen's reagent test
(c) Schiff's reagent test ~~(d) Sodium nitroprusside test~~
14. Which of the following will undergo nucleophilic addition reaction more easily:
- ~~(a) Aldehyde~~ (b) Alkene
(c) Aldehyde and ketone (d) All of these
15. Which of the following aldehydes is used to prepare urotropine medicine:
- (a) Acetaldehyde (b) Acetone
~~(c) Formaldehyde~~ (d) Ethyl alcohol

16. In which of the following compounds, carbon number is decreased during the oxidation:
- (a) Aldehyde ~~(b) Ketone~~
(c) Alcohol (d) Ether
17. Which of the following is used as ink preservative:
- (a) Alcohol (b) Aldehyde
(c) Ether ~~(d) Phenol~~
18. Which one of the following compounds is not derivative of NH_3 :
- (a) Aniline (b) Hydrazine
(c) Phenyl hydrazine ~~(d) Picric acid~~
19. Aldol compound consists of:
- (a) Aldehyde group (b) Hydroxyl group
(c) Carboxylic group (d) Both (a) and (b)
20. Which one of the following is the strongest reducing agent:
- (a) C_3H_8 ~~(b) CH_2O~~
(c) $\text{C}_3\text{H}_7\text{OH}$ (d) CH_3COCH_3
21. When aldehyde reacts with Tollen's reagent:
- (a) A ketone is produced (b) An alcohol is produced
(c) Ag^+ ions are produced (d) Ag^+ ions are reduced
22. Which of the following reagents will react with both aldehydes and Ketones?
- ~~(a) Grignard reagent~~ (b) Tollen's reagent
(c) Fehling's reagent (d) Sodium nitroprusside
23. Cannizzaro's reaction is not given by:
- (a) Formaldehyde ~~(b) Acetaldehyde~~
(c) Benzaldehyde (d) Trichloro acetaldehyde
24. Which of the following will form brick red ppt. (Cu_2O) with Benedict's solution:
- ~~(a) $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{H}$~~ (b) $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{CH}_3$
(c) $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{OH}$ (d) $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{CH}_2 - \text{CH}_3$

25. Which of the following compounds will not give iodoform test on treatment with $I_2/NaOH$:
- (a) Acetaldehyde (b) Acetone
(c) 2-butanone ~~(d) 3-pentanone~~
26. Aldehyde and ketone have higher boiling point than corresponding compounds of the following except:
- (a) Alkanes (b) Alkenes
(c) Ethers ~~(d) Alcohols~~
27. The hybridization of C-atom in carbonyl group is:
- (a) sp ~~(b) sp^2~~
(c) sp^3 (d) dsp^2
28. Cyanohydrins are formed from carbonyl compounds by _____ reactions mechanism:
- (a) Free radical (b) Nucleophilic substitution
~~(c) Nucleophilic addition~~ (d) Electrophilic addition
29. The red brown ppt. of Fehling solution and Benedict solution tests are of:
- (a) Ag ~~(b) CuO~~
(c) Cu_2O (d) AgBr
30. Carbonyl compounds react with hydroxyl amine (NH_2OH) to form:
- (a) Hydrazone ~~(b) Oxime~~
(c) Cyanohydrin (d) Bisulphite addition product
31. Paraldehyde is polymer of:
- (a) HCHO ~~(b) CH_3CHO~~
(c) CH_3COCH_3 (d) $CH_3CH_2CH_2OH$
32. Paraldehyde is used as a:
- ~~(a) Medicine~~ (b) Poison
(c) Dye (d) Polymer
33. Calcium formate $Ca(HCOO)_2$ on dry heating yields:
- ~~(a) HCHO~~ (b) CH_3CHO
(c) CH_3COCH_3 (d) CH_3COOH

34. Aldehydes combine with alcohol in presence of hydrogen chloride gas to form:
 (a) Alkane (b) Acetal
 (c) Carboxylic acid (d) Ketones
35. Which of the following is not a use of formaldehyde:
 (a) Manufacture of dyes (b) Silvering of mirror
 (c) Making formamint (d) Antiseptic inhalent
36. Which of the following test is not given by aldehyde:
 (a) 2, 4 DNPH test (b) NaHSO₃ test
 (c) Tollen's test (d) Sodium nitroprusside test
37. Ketones on reduction produce:
 (a) P° alcohol (b) S° alcohol
 (c) T° alcohol (d) None
38. Which is not true about Cannizzaro's reaction:
 (a) Self oxidation reduction (b) Concentrated NaOH
 (c) Disproportionation reaction (d) Dilute NaOH
39. Aldehyde give precipitate with Fehling solution on:
 (a) Cooling (b) Heating
 (c) Boiling (d) Do not give ppt.
40. Which of the following compound is least reactive:
 (a) HCHO (b) CH₃CHO
 (c) CH₃COCH₃ (d) C₆H₅CHO

answers

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

CHAPTER 13

CARBOXYLIC ACID

MULTIPLE CHOICE QUESTIONS

- Ninhydrin reacts with amino acid to form product which has colour:**
(a) Blue (b) Violet
~~(c) Bluish violet~~ (d) Red
- Slight oxidation of primary alcohol gives:**
(a) Ketone (b) Organic acid
~~(c) Aldehyde~~ (d) An ester
- Which of the following is the strongest acid:**
~~(a) HCOOH~~ (b) CH₃COOH
(c) CH₃ – CH₂ – COOH (d) Cl – CH₂ – COOH
- Which of the following esters shows the flavour of orange:**
(a) Benzyl acetate (b) Iso-butyl formate
~~(c) Octyl acetate~~ (d) Ethyl butyrate
- Which acid is used in the manufacture of synthetic fibre:**
(a) Formic acid ~~(b) Acetic acid~~
(c) Carbonic acid (d) Benzoic acid
- Some amino acids are most important because they are the final product of hydrolysis of peptide and protein and they are:**
~~(a) α-amino acid~~ (b) β-amino acid
(c) γ-amino acid (d) All of the above
- In amino acid proton is transferred from one point to the other point and this dipolar ion is called:**
(a) Oxonium ion (b) Carbonium ion
~~(c) Zwitter ion~~ (d) Carbanion

8. Which of the following is neutral amino acid:
- ~~(a)~~ Glycine (b) Histidine
(c) Lysine (d) Aspartic acid
9. The amino acid which body can synthesize are called:
- (a) Essential ~~(b)~~ Non-essential
(c) Acidic (d) Basic
10. Amino acids are classified into following types:
- (a) Acidic (b) Basic
(c) Neutral ~~(d)~~ All
11. By convention a peptide having molecular mass upto 10,000 is called:
- (a) Peptide ~~(b)~~ Polypeptide
(c) Protein (d) Dipeptide
12. Acetic acid is manufactured commercially by:
- (a) Distillation ~~(b)~~ Fermentation
(c) Ozonolysis (d) Esterification
13. Which of the following derivative can't be prepared directly from acetic acid:
- (a) Acetic anhydride (b) Acetyl chloride
~~(c)~~ Acetamide (d) Ethyl ethanoate
14. Which reagent is used to reduce a carboxylic group to an alcohol:
- (a) H_2/Ni (b) HI/P
(c) $NaBH_4$ ~~(d)~~ $LiAlH_4$
15. The solution of which acid is used for seasoning of food:
- (a) Formic acid ~~(b)~~ Acetic acid
(c) Benzoic acid (d) Butanoic acid
16. Which one of the following element is not present in all proteins:
- (a) Carbon (b) Hydrogen
(c) Nitrogen ~~(d)~~ Sulphur

17. The IUPAC name of $\begin{array}{c} \text{CH}_2 - \text{COOH} \\ | \\ \text{CH}_2 - \text{COOH} \end{array}$ is:
- (a) Succinic acid (b) Butanoic acid
(c) Dibutanoic acid ~~(d) But-1, 4-dioic acid~~
18. $\text{C}_2\text{H}_5\text{Br} \xrightarrow{\text{KCN}} \text{A} \xrightarrow{\text{H}_2\text{O}/\text{H}^+} \text{B}$
The compound 'B' is:
- (a) Acetic acid ~~(b) Propanoic acid~~
(c) Ethyl alcohol (d) Propionaldehyde
19. Which of the following will react with both ethanol and ethanoic acid at room temperature:
- (a) CaCO_3 (b) CuO
~~(c) Na-metal~~ (d) CH_3OH
20. Which one of the following is not an amino acid:
- (a) Alanine (b) Glycine
(c) Aspartic acid ~~(d) Aniline~~
21. Which one of the following metal can evolve hydrogen from acetic acid:
- ~~(a) Na~~ (b) Fe
(c) Al (d) Cu
22. Which one of the following is not a dicarboxylic acid:
- (a) Malonic acid ~~(b) Valeric acid~~
(c) Maleic acid (d) Succinic acid
23. The compound $\begin{array}{c} \text{HO} - \text{CH} - \text{COOH} \\ | \\ \text{HO} - \text{CH} - \text{COOH} \end{array}$ is commonly called:
- (a) Lactic acid (b) Citric acid
~~(c) Tartaric acid~~ (d) Succinic acid
24. Reverse of esterification is known as:
- (a) Trans esterification (b) Dehydration
~~(c) Hydrolysis~~ (d) Decarboxylation

25. The general formula of monocarboxylic acid:
 (a) C_nH_nCOOH ~~(b) $C_nH_{2n+1}COOH$~~
 (c) $C_nH_{2n}COOH$ (d) $C_nH_{2n-2}COOH$
26. The simplest of all amino acid:
 (a) Lysine (b) Glycine
 (c) Alanine (d) Aspartic acid
27. Carboxylic acid can be changed to acid chloride by the treatment with:
 (a) S_2Cl_2 ~~(b) $SOCl_2$~~
 (c) HCl (d) $HOCl$
28. Which product is not formed when acetic acid reacts with $SOCl_2$ (Thionyl chloride):
~~(a) CH_3Cl~~ (b) CH_3COCl
 (c) HCl (d) SO_2
29. Which one of the following reagent is used to convert acetic acid to ethane?
 (a) $LiAlH_4$ ~~(b) HI and Red P~~
 (c) P_2O_5 (d) $SOCl_2$ and pyridine
30. The weakest carboxylic acid:
 (a) $HCOOH$ (b) CH_3CH_2COOH
 (c) CH_3COOH (d) $ClCH_2COOH$

answers

1.	(c)	2.	(c)	3.	(a)	4.	(c)	5.	(b)
6.	(a)	7.	(c)	8.	(a)	9.	(b)	10.	(d)
11.	(b)	12.	(b)	13.	(c)	14.	(d)	15.	(b)
16.	(d)	17.	(d)	18.	(b)	19.	(c)	20.	(d)
21.	(a)	22.	(b)	23.	(c)	24.	(c)	25.	(b)
26.	(b)	27.	(b)	28.	(a)	29.	(b)	30.	(b)

MULTIPLE CHOICE QUESTIONS

- Which one of the following is inorganic polymer:

(a) Graphite

(b) Rubber

(c) DNA

(d) Protein
- Hardening of oil involves which of the following process:

(a) Oxidation

(b) Hydrogenation

(c) Saponification

(d) Hydrolysis
- Which characteristic functional group is present in fats:

(a) Aldehyde

(b) Ketone

(c) Carboxylic acid

(d) Ester
- In which of the following case Zn^{2+} ions are used as co-factor:

(a) Chrome oxidase

(b) Carbonic anhydrase

(c) Glucose

(d) Anaerobic oxidation of $\text{C}_6\text{H}_{12}\text{O}_6$
- Which of the following is an example of associated lipid:

(a) Stearin

(b) Lipoprotein

(c) Vitamin D

(d) Glycerol phospholipid
- Formation of Terylene and Nylon both are examples of:

(a) Addition reaction

(b) Elimination reaction

(c) Condensation reaction

(d) Hydrogenation reaction
- Quantitatively unsaturation of oils is determined by:

(a) Iodine-number

(b) Acid number

(c) Passing H_2 gas

(d) Adding Br_2

8. Cholesterol belong to:
- (a) Vitamins (b) Carbohydrates
(c) Fats ~~(d) Lipids~~
9. Amino acids in protein are linked together by:
- (a) Ester linkage ~~(b) Peptide linkage~~
(c) Ether linkage (d) Glycosidic linkage
10. The colour which cellulose can give with I_2 solution:
- (a) Blue (b) Green
(c) Red ~~(d) No colour~~
11. Which one of the following plastic is a thermo setting plastic:
- (a) PVC (b) Polystyrene
(c) Polyethylene ~~(d) Bakelite~~
12. Which one of the following polymer is called a polyamide:
- (a) Rayon (b) Orlon
~~(c) Nylon~~ (d) Terylene
13. Which of the following enzymes bring about the hydrolysis of fats:
- (a) Urease (b) Maltase
(c) Zymase ~~(d) Lipase~~
14. Which one of the following is a water soluble vitamin:
- (a) Vit-A (b) Vit-D
(c) Vit-E ~~(d) Vit-C~~
15. Which one of the following element is not present in all proteins:
- (a) Carbon (b) Hydrogen
(c) Nitrogen ~~(d) Sulphur~~
16. Which one of the following is purine:
- (a) Cytosine (b) Uracil
~~(c) Adenine~~ (d) Thiamine
17. Which one of the following is not a fatty acid:
- (a) Oleic acid (b) Stearic acid
~~(c) Phtalic acid~~ (d) Butanoic acid

18. Which of the following is optimum temperature of most of enzymes:
(a) 0°C (b) 37°C
(c) 45°C (d) 100°C
19. Which of the following is the most abundant organic substance found in nature:
(a) Fructose (b) Starch
(c) Cellulose (d) Glucose
20. Cholesterol is an important precursor in the biosynthesis of:
(a) Adrenal hormone (b) Sex hormone
(c) Vitamin D (d) All of these
21. Vegetable oils are:
(a) Unsaturated fatty acids
(b) Glycerides of saturated fatty acids
(c) Saturated fatty acids
(d) Glycerides of unsaturated fatty acids
22. The fiber which is made from acrylonitrile as monomer:
(a) Acrylone fiber (b) Polyester fiber
(c) PVC (d) Rayon fiber
23. Which of these enzymes is an acidic pH active enzymes:
(a) Lipase (b) Amylase
(c) Pepsin (d) Trypsin
24. Which of these polymers is a synthetic polymer:
(a) Animal fat (b) Starch
(c) Cellulose (d) Polyester
25. Which of these polymers is an addition polymer:
(a) Nylon-6, 6 (b) Starch
(c) Cellulose (d) Polyester
26. Which of the following is not a polymer:
(a) Starch (b) Glucose
(c) Protein (d) Nylon

answers

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

MULTIPLE CHOICE QUESTIONS

1. Which component, if present in paper causes brittleness:

(a) Chlorine	(b) Cellulose
(c) Sodium hydroxide	(d) Lignin
2. Which of the following three elements are largely needed for healthy growth of plants:

(a) N, P, S	(b) N, P, C
(c) N, P, K	(d) N, P, H
3. Nitrogen helps in:

(a) Normal growth of plant	(b) Protein synthesis
(c) Nucleic acid synthesis	(d) All of above
4. The nutrients which are required in very small amount for growth of plants are called:

(a) Nitrogenous fertilizers	(b) Micronutrients
(c) Macronutrients	(d) Surfactants
5. Which of the following element is not macro-nutrient:

(a) B	(b) Ca
(c) S	(d) H
6. Which of the following is not micro-nutrient:

(a) Fe	(b) Mn
(c) Cu	(d) H

7. Which of the following is not calcareous material:
- (a) Lime stone (b) Marine shell
~~(c) Clay~~ (d) Marble
8. Which is not argillaceous material:
- ~~(a) Lime stone~~ (b) Clay
(c) Slate (d) None
9. The %age of nitrogen in NH_4NO_3 is:
- ~~(a) 33 – 33.5%~~ (b) 30 – 33.5%
(c) 30 – 32.5% (d) 31 – 32%
10. What is the main function of rotary kiln:
- (a) Heating lime stone (b) Heating of clinker
(c) Drying of slurry ~~(d) Preparation of clinker~~
11. Which of the following process is alkaline:
- ~~(a) Kraft process~~
(b) Sulphite process
(c) Neutral sulphite semi chemical process (NSSC)
(d) None
12. DAP contains P_2O_5 :
- ~~(a) 48%~~ (b) 38%
(c) 68% (d) 75%
13. Which of the following compounds is present in highest percentage in cement:
- ~~(a) Lime~~ (b) Clay
(c) Na_2O (d) Alumina
14. Which fertilizer is widely used in Pakistan:
- ~~(a) Urea~~ (b) KNO_3
(c) DAP (d) K_2SO_4
15. Which of the following fertilizers, contains 75% nutrient:
- ~~(a) DAP~~ (b) TAP
(c) Urea (d) NH_4NO_3

16. Which of the following is woody material:
(a) Bamboo (b) Poplar
(c) Bagasse (d) Wheat straw
17. Which of the following is main process in paper industry:
(a) Screening (b) Bleaching
(c) Digestion (d) Stock preparation
18. Which of the following bleaching agents is largely used for bleaching of pulp, in Pakistan:
(a) O_2 (b) O_3
(c) ClO_2 (d) Cl_2
19. Micronutrients requirement (per acre) for the normal fertility of soil:
(a) 4 – 10 g (b) 6 – 200 kg
(c) 6 – 200 g (d) None of above
20. The word paper is derived from reedy plant:
(a) Papyrus (b) Rose
(c) Acacia (d) Papaya
21. The nutrients which are required in very small amount for growth of plants are called:
(a) Nitrogenous fertilizers (b) Micronutrient
(c) Macronutrient (d) Surfactants
22. What is clinker:
(a) Roasted calcareous material
(b) Roasted gypsum
(c) Roasted argillaceous
(d) Roasted calcareous and argillaceous material
23. Which one of the following is woody raw material used for making pulp and paper:
(a) Eucalyptus (b) Wheat straw
(c) Bagasse (d) Cotton linter
24. Which of the following fertilizer is not useful for paddy rice:
(a) DAP (b) Ammonium sulphate
(c) Urea (d) Ammonium nitrate

25. Which substance is used as filler or additive in paper making:
(a) Cellulose (b) Starch
(c) Lime ~~(d) Gypsum salt~~
26. Phosphorus helps the growth of:
(a) Root (b) Leave
(c) Stem ~~(d) Seed~~
27. Rotary kiln has how many zones:
(a) 2 (b) 3
~~(c) 4~~ (d) 5
28. Which element is often present in all fertilizers:
~~(a) Nitrogen~~ (b) Carbon
(c) Phosphorus (d) Potassium
29. The %age of nitrogen in urea is:
(a) 35% ~~(b) 46%~~
(c) 82% (d) 75%
30. "Rock Phosphate" has composition of:
(a) CaH_3PO_4 (b) $\text{Ca}(\text{H}_2\text{PO}_4)_2$
~~(c) $\text{Ca}_3(\text{PO}_4)_2$~~ (d) CaHPO_4
31. Which one of the following is an organic fertilizers:
(a) Manure (b) Amonium nitrate
(c) Urea ~~(d) Both (a) and (c)~~
32. Which of the following cannot be used as phosphatic fertilizer:
(a) CaH_3PO_4 (b) $(\text{NH}_4)_2\text{HPO}_4$
~~(c) $\text{Ca}_3(\text{PO}_4)_2$~~ (d) P_2O_5
33. Cement was introduced by a mason:
(a) D-H Whore (b) Humphry Davy
~~(c) Joseph Aspdin~~ (d) F. Wholer
34. The %age gypsum in the cement is:
(a) 1 – 2% (b) 2 – 3%
(c) 3 – 4% ~~(d) 4 – 5%~~
35. In the cement manufacture, the digester revolves at R.P.M.
(a) 2 ~~(b) 2.5~~
(c) 3.0 (d) 3.5

answers

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

MULTIPLE CHOICE QUESTIONS

1. **Synthetic organic chemicals can cause which of the following problems:**
 - (a) Nausea
 - (b) Dizziness
 - (c) Blindness
 - ☒ (d) All of the above
2. **Which of the following is considered as cause of pollution:**
 - (a) Rapid increase in population
 - (b) Industrialization
 - (c) Transportation
 - ☒ (d) All of the above
3. **Which of the following is primary pollutant:**
 - (a) H_2SO_4
 - (b) N_2O
 - (c) H_2CO_3
 - ☒ (d) SO_2
4. **In which of the following layer of atmosphere there is more thickness of ozone:**
 - (a) Troposphere
 - ☒ (b) Stratosphere
 - (c) Mesosphere
 - (d) Thermosphere
5. **Which of the following air pollutants is quiet killer:**
 - (a) CO_2
 - ☒ (b) CO
 - (c) NO_2
 - (d) N_2O_4
6. **The cause of water pollution is:**
 - (a) Pesticides
 - (b) Detergents
 - (c) Tanneries
 - ☒ (d) All
7. **The pH value of the acid rain is in the range of:**
 - (a) 6.5 – 7.0
 - ☒ (b) Less than 5.6
 - (c) Less than 5.0
 - (d) Less than 7.0

8. Which of the following factors help to measure quality of water:
- (a) DO (b) BOD
(c) COD ~~(d) All of above~~
9. Which method is used to remove permanent hardness of water:
- (a) Aeration (b) Coagulation
~~(c) Ion exchange~~ (d) Chlorination
10. To avoid, formation of toxic compounds with chlorine which of the followings is better to use as a disinfectant of water:
- ~~(a) O₃~~ (b) ClO₃
(c) Both (d) None
11. Peroxyacetyl nitrate (PAN) is an irritant to human beings and it affects:
- ~~(a) Eyes~~ (b) Ears
(c) Stomach (d) Nose
12. A single chlorine free radical can destroy how many ozone molecules:
- (a) 100 (b) 10,000
(c) 10,00,000 ~~(d) 100,000~~
13. Ecosystem is a smaller unit of:
- (a) Lithosphere (b) Hydrosphere
~~(c) Biosphere~~ (d) Atmospheric
14. The coagulant used in the purification of potable water is:
- ~~(a) Alum~~ (b) Nickle sulphate
(c) Copper sulphate (d) Barium sulphate
15. Newspaper can be recycled again and again, by how many times:
- (a) 2 (b) 3
(c) 4 ~~(d) 5~~
16. Which of the following is not common domestic materials which are recycled:
- (a) Paper ~~(b) Iron~~
(c) Glass (d) Plastics
17. The normal amount of overhead ozone is about:
- (a) 335 DU (b) 340 DU
(c) 345 DU ~~(d) 350 DU~~

18. When ground water seeps in the landfill a mixture of dissolved, suspended and microbial contaminants is formed, this mixture is called:
- (a) Rancidity (b) Incinerate
(c) Refuse (d) Leachate
19. The gas that binds strongly with hemoglobin is:
- (a) Carbon monoxide (b) Carbon dioxide
(c) Methane (d) Nitrogen oxide
20. The concentration of dissolved oxygen in water ranges from:
- (a) 4–8 ppm (b) 6–10 ppm
(c) 8–10 ppm (d) 0.4–0.8 ppm
21. Fungicides are the pesticides which:
- (a) Kill insects (b) Kill fungus
(c) Kill plants (d) Kill herbs
22. The main pollutant of leather tanneries in the waste water is due to the salt of:
- (a) Lead (b) Chromium (III)
(c) Chromium (VI) (d) Copper
23. The temperature in the incinerator of industrial waste products has a range:
- (a) 900–1000°C (b) 250–500°C
(c) 950–1300°C (d) 500–900°C
24. Which part of atmosphere is near to the earth:
- (a) Thermosphere (b) Troposphere
(c) Mesosphere (d) Stratosphere
25. Thickness of atmosphere is:
- (a) 100 km (b) 500 km
(c) 1000 km (d) 1500 km
26. How much fresh water is used for domestic purpose:
- (a) 8% (b) 23%
(c) 69% (d) 100%

27. The most abundant element in the earth crust is:
 (a) ☒ O (b) Si
 (c) Al (d) Fe
28. The residence time of NO is:
 (a) Few hours (b) 1 day
 (c) 3 days (d) ☒ 4 days
29. The mean residence time of methane (CH₄) in atmosphere is:
 (a) 1–2 years (b) 3–4 years
 (c) 3–5 years (d) ☒ 3–7 days
30. The yellow colour in photochemical smog is due to the presence of:
 (a) NO (b) ☒ NO₂
 (c) SO₂ (d) CO₂
31. Ozone depletion is mainly due to the reaction of ozone (O₃) with:
 (a) O₂ (b) ☒ CFCs
 (c) SO₂ (d) All of these
32. In human liver which substance cause cancer:
 (a) ☒ Chloroform (b) Methane
 (c) Carbon dioxide (d) H₂SO₃

answers

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