CH-01_ Introduction to Fundamental Concepts of Chemistry.docx
CH-02_ Three States of Matter (Part-1- Gases).docx
CH-02_ Three States of Matter (Part-2- Liquids & Solids).docx
CH-03_ The Atomic Structure.docx
CH-04_Chemical Bonding.docx
CH-05_Energetics of Chemical Reactions.docx
CH-06_ Chemical Equilibrium.docx
CH-07_Solutions and Electrolytes.docx
CH-08_ Introduction to Chemical Kinetics.docx
<table>
<thead>
<tr>
<th>Question</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
<th>Option D</th>
</tr>
</thead>
<tbody>
<tr>
<td>01. The process to arrange the elements in specific order is called ____________.</td>
<td>a) Classification</td>
<td>b) Arithmetic</td>
<td>c) Volume</td>
<td>d) Pressure</td>
</tr>
<tr>
<td>02. In these days, the classification of elements is based on ___________ numbers of the elements</td>
<td>a) Classification</td>
<td>b) Atomic</td>
<td>c) Molecular</td>
<td>d) None of these</td>
</tr>
<tr>
<td>03. The Triad system was introduced by ___________ in 1817.</td>
<td>a) Mayer</td>
<td>b) Newland</td>
<td>c) Dobereiner</td>
<td>d) Mendelev</td>
</tr>
<tr>
<td>04. According to Dobereiner’s laws, “The atomic mass of middle element of the triad is approximately the ___________ of the atomic masses of the other two elements”.</td>
<td>a) Negative</td>
<td>b) Positive</td>
<td>c) Simple</td>
<td>d) Average</td>
</tr>
<tr>
<td>05. The law of octaves was introduced by ___________ in 1866.</td>
<td>a) Dobereiner</td>
<td>b) Maxwell</td>
<td>c) Newland</td>
<td>d) Cathey</td>
</tr>
<tr>
<td>06. Mendelev was introduced his periodic law in ___________.</td>
<td>a) 1869</td>
<td>b) 1875</td>
<td>c) 1904</td>
<td>d) 1709</td>
</tr>
<tr>
<td>07. According to Mendelev’s periodic law, “The properties of elements were the ___________ function of their atomic masses”.</td>
<td>a) Modern</td>
<td>b) Periodic</td>
<td>c) Mass</td>
<td>d) None of these</td>
</tr>
<tr>
<td>08. Mendelev’s periodic table deals with the ___________</td>
<td>a) Prediction of new elements</td>
<td>b) Prediction of old elements</td>
<td>c) Modern theories</td>
<td>d) None of these</td>
</tr>
<tr>
<td>09. Mendelev placed Argon (40) before ___________.</td>
<td>a) Carbon (6)</td>
<td>b) Nitrogen (9)</td>
<td>c) Potassium (39)</td>
<td>d) Iodine (126.9)</td>
</tr>
<tr>
<td>10. Atomic number was introduced by ___________ in 1913.</td>
<td>a) Moseley</td>
<td>b) Maxwell</td>
<td>c) Joule</td>
<td>d) Henry</td>
</tr>
<tr>
<td>11. The wavelength of x-rays decreases with the ___________ of atomic number of elements.</td>
<td>a) Decreases</td>
<td>b) Increases</td>
<td>c) Space</td>
<td>d) Function</td>
</tr>
<tr>
<td>12. According to modern periodic law, “The physical and chemical properties of elements are the periodic function of their ___________”.</td>
<td>a) Molecular number</td>
<td>b) Atomic number</td>
<td>c) International</td>
<td>d) Wavelength</td>
</tr>
<tr>
<td>13. The horizontal rows in the periodic table are called ___________.</td>
<td>a) Periods</td>
<td>b) Groups</td>
<td>c) Isotopes</td>
<td>d) None of these</td>
</tr>
<tr>
<td>14. The vertical columns in the periodic table are called ___________.</td>
<td>a) Periods</td>
<td>b) Groups</td>
<td>c) Metals</td>
<td>d) Actinides</td>
</tr>
<tr>
<td>15. There are ___________ periods in periodic table.</td>
<td>a) Five</td>
<td>b) Four</td>
<td>c) Seven</td>
<td>d) Nine</td>
</tr>
</tbody>
</table>
16. The first period consists of ___________ elements.
   a) Four  b) Three  c) Two  d) Nine  
   C

17. There are ___________ groups in periodic table.
   a) Eight  b) Seven  c) Six  d) Four  
   A

18. The 6th period consists of ___________ elements.
   a) 23  b) 32  c) 12  d) 9  
   B

19. The 4th and 5th periods are called ___________ periods.
   a) long  b) Short  c) Small  d) Series  
   A

20. The further divided groups are called ___________.
   a) Isotopes  b) Sub-groups  c) Zero group  d) electrons  
   B

21. The group VIII-A is also called ___________.
   a) Zero group  b) Halogens  c) Transition group  d) Normal  
   A

22. The total number of unpaired electrons present in an atom is called its ___________.
   a) Valency  b) Ionization  c) Electronegativity  d) Electropositivity  
   A

23. The average of atomic weight and density is called ___________.
   a) Valence shell  b) Atomic volume  c) Atomic density  d) Ionization energy  
   B

24. When we go from left to right in the same period then the atomic volume ___________.
   a) Decreases  b) Increases  c) Periodic  d) Arranging  
   A

25. When we go from left to right along the same period then the ionization energy ___________.
   a) Decreases  b) Increases  c) Periodic  d) Arranging  
   B

26. The process in which an atom forms a negative ion is called ___________.
   a) Periodicity  b) Classification  c) Electronegativity  d) Electropositivity  
   C

27. The process in which an atom forms a positive ion is called ___________.
   a) Electropositivity  b) Classification  c) Electronegativity  d) None of these  
   A

28. Mendeleev’s periodic law is based on ___________.
   a) Molecular weight  b) Atomic weight  c) Atomic number  d) Modern classification  
   B

29. Modern periodic law is based on ___________.
   a) Atomic number  b) Atomic weight  c) Periodic table  d) None of these  
   A

30. The repetition of a property at regular intervals is called its ___________.
   a) Atomic number  b) Periodicity  c) Halogens  d) None of these  
   B

31. The discovery of inert gases rejected the law of ___________.
   a) Coinage metals  b) Octaves  c) Time table  d) None of these  
   B
34. The second and third periods are called _________ periods and contain only eight numbers
   a) Short       b) Long
   c) Actinides   d) Lanthanides  
A 

35. The elements of sub-group VII-A are called _________
   a) Halogens     b) Inert gases
   c) Noble gases d) Radon       
A 

32. There are _________ elements have been discovered so far.
   a) 92           b) 99
   c) 110          d) 125       
C 

33. Dobereiner, German chemist in 1817, arranged similar element into groups of three called:
   a) Threeds      b) Thrice
   c) Tetrads     d) Triades    
D 

34. Dobereiner said that the central atom of each set of elements had an atomic mass almost equal to the arithmetical mean of atomic masses of the other _________
   a) Two elements b) Three elements
   c) Four elements d) Five elements       
A 

35. Out of so far discovered 110 elements, naturally occurring are:
   a) 92           b) 100
   c) 90           d) 103       
A 

36. The properties of every eighth element from the given one were similar to the first is the law of:
   a) Pentave      b) Heptave
   c) Octave      d) Triades    
C 

37. Lother Meyer, a German chemist found that the __________ of the elements are the periodic function of their atomic weights
   a) Periodic properties     b) Reactive properties
   c) Physical properties     d) Chemical properties       
C 

38. In 1868’ Lother Meyer prepared a periodic table containing only __________
   a) 64 elements       b) 56 elements
   c) 48 elements       d) 72 elements       
B 

39. The repetition of a property at regular intervals is called its:
   a) Regularity       b) Uniformity
   c) Punctuality      d) Periodicity    
D 

40. The tabular arrangement of elements on the basis of periodicity of their properties is called:
   a) Periodic table     b) Time table
   c) Office table       d) Regular table       
A 

41. The discovery of __________ rejected the law of octaves.
   a) Halogens          b) Inert gases
   c) Alkali metals     d) Heavy metals     
B 

42. Gold was first placed in the platinum group, but when its atomic mass was corrected it was placed in the __________
   a) Second group      b) Zero group
   c) First group       d) Seventh group       
C 

43. Mendeleev’s periodic table failed to specify a position for:
   a) Hydrogen          b) Sodium
   c) Oxygen            d) Iron       
A
16. In Mendeleev’s periodic table, alkali metals were placed with ………. in the first group
   a) Alkaline earthly metals  b) Rare-earths metals
c) Metaloids  d) Coinage metals

18. “The physical and chemical properties of elements are the periodic function of their atomic number” is the statement of:
   a) Modern periodic law  b) Mendeleev’s periodic law
c) Newland’s law  d) Dobereiner’s law

19. The modern periodic table of elements was recommended by the International Union of Pure and Applied Chemists (IUPAC) in ………..
   a) 1840  b) 1945
c) 1920  d) 1892

21. In the periodic table groups are in the:
   a) Right side  b) Horizontal columns
c) Vertical columns  d) Left side

22. The s-block elements include the elements of group ………. of the periodic table.
   a) I-A and II-A  b) I-B and II-B
c) III-A and IV-A  d) III-B and IV-B

23. The elements in which the electrons are being filled in the ‘s’ sub-shell are called:
   a) d-block elements  b) f-block elements
c) p-block elements  d) s-block elements

24. The p-block elements are those in which ……… are being filled in the ‘p’ sub-shell.
   a) Protons  b) Electrons
c) Neutrons  d) Nucleons

25. The elements of sub-group III-A, IV-A, V-A, VI-A, VII-A and VIII-A of the periodic table are included in:
   a) s-block elements  b) p-block elements
c) d-block elements  d) f-block elements

26. In f-block elements the electrons are being filled in the ‘f’ sub-shell and includes:
   a) Lanthanides and actinides  b) Transition elements
c) typical elements  d) I and II groups

27. The ‘s’ and ‘p’ block elements are collectively called:
   a) Transition elements  b) Rare-earth elements
c) Typical elements  d) Transuranium elements

28. The series of rare-earth elements which starts from Lanthanum are called:
   a) Typical elements  b) Transition elements
c) Actinides  d) Lanthanides

29. The first period contains two elements hydrogen and:
   a) Helium  b) Nitrogen
c) Oxygen  d) Chlorine

30. The second and third periods are called short periods and contain only ……… elements each.
   a) 10  b) 6
c) 12  d) 8

31. The longest period of the periodic table i.e. sixth period contains ……… elements:
   a) 30  b) 28
c) 32  d) 34

32. The sixth period of the periodic table starts from alkali metal Cesium (Cs55) and ends at:
   a) Radium (Ra88)  b) Actinium (Ac89)
c) Uranium (U92)  d) Radon (Rn86)
33. The elements after uranium (U92) are called:
   a) Pro-uranium elements  
   b) Trans-uranium elements  
   c) Pre-uranium elements  
   d) Meta-uranium elements

34. The elements of sub-groups ‘A’ are called:
   a) Trans-uranium elements  
   b) Typical elements  
   c) Transition elements  
   d) Main elements

36. Coinage metals are elements of sub-group I-B and these includes:
   a) Cu, Ag, Au  
   b) Zn, Cd, Hg  
   c) Fe, Co, Ni  
   d) Cu, Zn, Ni

37. The number of unpaired electrons in the outermost shell of an atom is called its:
   a) Electronegativity  
   b) Electron affinity  
   c) Ionization potential  
   d) Valency

39. The electronegativities of elements decrease from ……… in a period.
   a) Top to bottom  
   b) Bottom to top  
   c) Left to right  
   d) Right to left

40. The amount of energy required to remove the most loosely bound electron from the outermost shell of an isolated gaseous atom in its ground state to form gaseous positive ion is called its:
   a) Ionization potential energy  
   b) Electronegativity  
   c) Electron affinity  
   d) Electricity

736. Who made use of the idea of relationship between atomic weights and properties of the elements for their classification?
   a) Dobereiner  
   b) Al Razi  
   c) Newlands  
   d) Lother meyer

737. Who attempted the classification of elements in order of their increasing atomic weights?
   a) Dobereiner  
   b) Al Razi  
   c) Newlands  
   d) Mendeleev’s

738. Who said that physical and chemical properties of elements are periodic functions of their atomic weights?
   a) Al Razi  
   b) Mendeleev’s  
   c) Mosely  
   d) Newton

739. According to Moseley, what is the fundamental property
   a) Atomic weight  
   b) Atomic number  
   c) Volume  
   d) Mass

740. According to modern periodic table, elements are arranged according to ascending order of their
   a) Atomic volume  
   b) Atomic weight  
   c) Atomic number  
   d) Molar mass

741. Which orbital is in the process of completion in case of transition elements?
   a) p-orbital  
   b) f-orbital  
   c) d-orbital  
   d) s-orbital

742. Which is the longest period of the periodic table?
   a) 5th  
   b) 7th  
   c) 6th  
   d) 2nd

743. The properties of the elements are directly related to
   a) Valency  
   b) Ionization energy  
   c) Electronegativity  
   d) All these

745. The fourteen elements following lanthanum are called
   a) Actinides  
   b) Lanthanides  
   c) Trans-uranic elements  
   d) None of these
According to modern periodic law, the properties of the elements are directly related to
a) Valency b) Ionization energy
c) Electron affinity d) All these

Which is the transition element among the following?
(a) B (b) Al (c) Cu (d) Cs

All the elements in a particular group possess similar
a) Electronegativity b) Ionic radii
c) Atomic size d) Valence electronic configuration

Volume in cubic centimeter occupied by one gram atom of the element is known as
a) Specific volume b) Molar volume
c) Atomic volume d) None of these

In a group, atomic volume gradually
a) Decreases b) Increases
c) Remains constant d) First increases then decreases

The amount of energy required to remove an electron from an atom of an element in the gaseous state is called
a) Electron affinity b) Electronegativity
c) Ionization energy d) None of these

In a group, the ionization energy
a) Increases b) Decreases
c) Remains constant d) First increases then decreases

In a period, the value of ionization energy
a) Increases b) Decreases
c) Remains constant d) First increases then decreases

A substances showing variable intensity of property in different directions in called
a) Allotropy b) Anisotropy
c) Cleavage d) None of these

To which family does Ga belong
(a) boron (b) carbon (c) nitrogen (d) beryllium

To which family does Bi belong
(a) boron (b) carbon (c) nitrogen (d) oxygen

The elements of group IA are called
(a) chalcogens (b) halogens
c) alkali metals (d) alkaline earth metals

The elements of group IIA are called
(a) halogens (b) noble gases
c) alkali metals (d) alkaline earth metals

What is the nature of Na₂O?
(a) basic (b) weakly basic
c) strongly basic (d) acidic

What is the nature of SO₂?
(a) basic (b) strongly basic
c) weakly basic (d) amphoteric

What is the nature of Al₂O₃?
(a) acidic (b) basic
c) amphoteric (d) neutral
765. The element U belongs to
   a) halogens  
   b) alkali metals
   c) actinides  
   d) neutral

766. The fourth period contains ________ elements
   a) 8  
   b) 16
   c) 18  
   d) 32

767. The atomic number of iodine is
   a) 35  
   b) 53
   c) 127  
   d) 17

769. Which of the following is a member of transition series?
   a) Zn  
   b) Al
   c) B  
   d) Br

770. Which of the following is coinage metal?
   a) Ag  
   b) Cu
   c) Au  
   d) all these

92   C
93   C
94   B
95   A
96   D
01. Hydrogen is discovered by.
   a) Cavendish  b) Dalton
   c) Bohr       d) Rutherford
   A

02. Hydrogen, at ordinary temperature and pressure exist in nature in the.
   a) Solid state  b) Liquid state
   c) Gaseous state d) Plasma state
   C

03. In 1766, first of all Cavendish prepared hydrogen by the action of Zn with.
   a) Dil. H₂SO₄  b) Dil. HCl
   c) Dil. HNO₃  d) Dil. HNO₂
   B

04. The most abundant compound of hydrogen is.
   a) H₂SO₄  b) CH₄
   c) NaOH   d) H₂O
   D

06. Hydrogen atom contains.
   a) One proton  b) Two protons
   c) Three neutrons d) No proton
   A

07. The electron configuration of hydrogen atom is.
   a) 1s²  b) 1s²
   c) 1s  d) 1s², 2s¹
   C

08. During the electrolysis of water, oxygen is liberated at the.
   a) Diode  b) Tetrad
   c) Cathode d) Anode
   D

09. The lightest gas in the universe is.
   a) Nitrogen  b) Neon
   c) Oxygen   d) Hydrogen
   D

10. Hydrogen atom contain only one electron in its outer most shell (1s¹) like the atom of.
    a) Halogens  b) Alkali metals
    c) Noble gases  d) Alkaline earth metals
    B

11. Like alkali metals the oxidation state of hydrogen is.
    a) +1  b) -1
    c) +2  d) -2
    A

12. Hydrogen requires only _______ electron(s) to complete its outer most shell.
    a) One  b) Two
    c) Three  d) Four
    A

13. Hydrogen loses an electron readily to form.
    a) H⁻  b) H⁺
    c) H₂⁻  d) H₂⁺
    B

14. Isotopes of an element have the same.
    a) Atomic weight  b) Atomic number
    c) Atomic mass   d) Number of neutrons
    B

15. In ordinary hydrogen gas the percentage of protium is.
    a) 0.0156  b) 15.5
    c) 99.98   d) 20.003
    C

16. In deuterium atoms the number of neutrons are.
    a) 0  b) 2
    c) 1   d) 3
    C

17. The atomic weight of tritium isotope of hydrogen is.
    a) 1  b) 2
    c) 4   d) 3
    D

- 1 -
19. When steam is passed over red hot coke at 1000°C it decomposes to give a mixture of CO and hydrogen gases called.
   a) Water glass  
   b) Hot gas  
   c) Liquid gas  
   d) Water gas  
   Answer: D

20. CO gas is liquefied by liquid air at.
   a) -192°C  
   b) 192°C  
   c) -192°F  
   d) 192°F  
   Answer: A

21. The percentage purity of hydrogen gas, obtained by the hydrolysis of water, is.
   a) 99%  
   b) 99.9%  
   c) 100%  
   d) 98%  
   Answer: C

22. Natural gas mostly consists of.
   a) H₂  
   b) CH₄  
   c) N₂  
   d) O₂  
   Answer: B

23. Hydrogen gas is absorbed on the surface of certain metals like Ni, Pt and ________
   a) U  
   b) V  
   c) Pd  
   d) W  
   Answer: C

24. H₂ → 2[H]  
   a) 273  
   b) 100  
   c) 1000  
   d) 550  
   Answer: C

25. Addition of hydrogen or removal of oxygen in a chemical reaction is called:
   a) Oxidation  
   b) Reduction  
   c) absorption  
   d) Adsorption  
   Answer: B

26. Metal oxides when heated in hydrogen are reduced to ……………
   a) Free metal  
   b) Metal hydride  
   c) Metal oxide  
   d) Metal peroxide  
   Answer: A

27. Addition of hydrogen to a molecule is called.
   a) Reduction  
   b) Oxidation  
   c) Hydration  
   d) Hydrogenation  
   Answer: D

28. When an edible oil is heated with hydrogen gas in the presence of ……….. as a catalyst, it is solidified due to hydrogenation.
   a) Ni  
   b) Co  
   c) Pt  
   d) Pd  
   Answer: A

29. Hydrogenation always occur in the presence of a suitable………..
   a) Reactants  
   b) Catalyst  
   c) Temperature  
   d) Chemist  
   Answer: B

30. Alkenes are hydrogenated to.
   a) Alkaline  
   b) Alkyls  
   c) Alkynes  
   d) Alkenes  
   Answer: D

31. Hydrogen reacts readily with halogens to produce.
   a) Halides  
   b) Sulphides  
   c) Nitrides  
   d) Phosphines  
   Answer: A

32. The preparation of ammonia by the reaction of hydrogen and oxygen in the presence of a catalyst at high temperature and pressure is called.
   a) Salvy process  
   b) Haber process  
   c) Grignard process  
   d) Cavendish process  
   Answer: B

33. Phosphine is formed by heating hydrogen directly with.
   a) Sulphur  
   b) Nitrogen  
   c) Phosphorus  
   d) Halogen  
   Answer: C
34. Hydrogen at the time of its evolution during a chemical reaction is called.
   a) Infant hydrogen  b) Hydrogen gas  c) Molecular hydrogen  d) Nascent hydrogen
   Answer: d  
35. The compounds formed by two elements are called.
   a) Binary compounds  b) Tertiary compounds  c) Di-elemental compounds  d) Hydrides
   Answer: a  
36. Hydrides of alkali metals and alkaline earth metals are called.
   a) Saline hydrides  b) Alkaline hydrides  c) Covalent hydrides  d) Complex hydrides
   Answer: b  
37. Methane, ammonia, water and hydrogen chloride are.
   a) Ionic hydrides  b) Covalent hydrides  c) Complex hydrides  d) Metallic hydrides
   Answer: b  
38. Example of complex hydrides are.
   a) BaH$_2$ and CaH$_2$  b) PH$_3$ and SiH  c) TaH$_{1.76}$ and VH$_{0.56}$  d) NaBH$_4$ and LiAlH$_4$
   Answer: d  
39. Hydrides which are non stoichiometric in nature are.
   a) Complex hydrides  b) Covalent hydrides  c) Metallic hydrides  d) Ionic hydrides
   Answer: c  
40. The hydrides which are good conductors of electricity in the fused state are.
   a) Ionic hydride  b) Covalent hydrides  c) Complex hydrides  d) None of the above
   Answer: a  
41. The law of chemical combinations are not obeyed by.
   a) Ionic hydride  b) Covalent hydrides  c) Interstitial hydride  d) None of the above
   Answer: C  
42. Hydrogen gas was discovered by.
   a) Lavoiser  b) Cavendish  c) Dalton  d) None of the above
   Answer: b  
43. Isotopes are atoms of the same element which differ only in.
   a) Electrons  b) Neutrons  c) Protons  d) None of these
   Answer: B  
44. The ordinary hydrogen is named as.
   a) Protium  b) Deuterium  c) Tritium  d) None of the above
   Answer: A  
45. The D$_2$O is commonly called.
   a) Heavy water  b) Hard water  c) Soft water  d) None of the above
   Answer: A  
46. The element of group III-A form.
   a) Ionic hydride  b) Covalent hydride  c) Complex hydride  d) None of the above
   Answer: C  
47. When hydrogen occupies in small spaces of transition metal known as.
   a) Ionic hydride  b) Covalent hydride  c) Interstitial hydride  d) complex hydride
   Answer: C  
48. The most abundant compound of hydrogen is.
   a) CH$_4$  b) H$_2$O  c) NH$_3$  d) H$_2$S
   Answer: B  
49. A tritium nucleus has
   a) Two electrons and one proton  b) One proton and two neutrons  c) One proton and three electrons  d) Three protons and two neutrons
   Answer: B
13. Ionic hydrides are usually.
   a) Good reducing agent       b) Good electrical conductors
   c) Bad reducing agent        d) Liquids at room temperature

14. Hydrogen is an important constituent of.
   a) Natural gas                b) Petroleum
   c) Water                      d) All of the above

15. What is the commonest gas in the atmosphere.
   a) He+                       b) H₂
   c) N₂                         d) NH₃

16. The formula of heavy water is.
   a) D₂O                       b) H₂O
   c) FeO₂                      d) T₂O

17. Hydrogen exists in nature in the_________ state of ordinary temperature and pressure.
   a) Solid                     b) Gaseous
   c) Liquid                    d) None of the above

18. Salts like hydrides are.
   a) Solid                     b) Gaseous
   c) Liquid                    d) Metals

19. The freezing point of hydrogen is.
   a) -252°C                    b) -259°C
   c) -152°C                    d) -352°C

20. The boiling point of hydrogen is.
   a) 259°C                     b) -359°C
   c) -252°C                    d) 100°C

21. What is the color of hydrogen when it burns in air.
   a) White                     b) Blue
   c) Red                       d) Green

22. Larger portion of ordinary hydrogen consists of.
   a) Deuterium                 b) Protium
   c) Tritium                   d) None of the above

23. Deuterium is present in ordinary hydrogen gas in.
   a) Great amounts             b) Small amounts
   c) Does not present          d) Ionic hydrides

24. The atom of same element having the same atomic number but different atomic weights are called.
   a) Isotopes                  b) Covalent hydrides
   c) Halogens                  d) Ionic hydrides

25. The atomic weight of heavy hydrogen is.
   a) 2                         b) 3
   c) 1                         d) 7

26. Bond energy of H₂ is.
   a) 1312 KJ/mole              b) 435 KJ/mole
   c) 520 KJ/mole               d) 430 KJ/mole

27. The lightest element in nature is.
   a) Hydrogen                  b) Oxygen
   c) Nitrogen                  d) Helium

28. 1.008 is the atom weight of.
   a) Oxygen                    b) Helium
   c) Nitrogen                  d) Hydrogen
29. In the combined state hydrogen is present in the compounds of.
   a) Oxygen
   b) Sulphur
   c) Nitrogen
   d) Carbon
   Ans. (C)  

30. Hydrogen atom contains only ______ electron(s) in its outer most shell (1s$^1$) like alkali metal atoms.
   a) One
   b) Two
   c) Three
   d) Five
   Ans. (A)  

31. How many electrons are permissible in k-shell?
   a) Two
   b) Three
   c) Four
   d) A great number
   Ans. (A)  

32. Hydrogen form covalent compounds with.
   a) Alkali metals
   b) Halogens
   c) Isotopes
   d) None of the above
   Ans. (B)  

33. Hydrogen is a.
   a) Diatomic gas
   b) Monatomic gas
   c) Both diatomic and monoatomic
   d) None of the above
   Ans. (C)  

34. During electrolysis hydrogen gas is deposited at.
   a) Anode
   b) Cathode
   c) Both of them
   d) None of the above
   Ans. (B)  

37. Alkali metal hydrides have________ structures like alkali metals.
   a) Cubic
   b) Hexagonal
   c) Tetrahedral
   d) None of the above
   Ans. (A)  

40. Hydrogen gas can be prepared on large or industrial scale from.
   a) Water
   b) Natural gas
   c) Electrolysis of brine
   d) All of the above
   Ans. (A)  

41. Hydrogen is a/an.
   a) Colorless gas
   b) Odourless gas
   c) Tasteless gas
   d) All of the above
   Ans. (D)  

42. Hydrogen dissociates into hydrogen atoms at.
   a) Ordinary temperature
   b) Higher temperature
   c) Lower temperature
   d) All of the above
   Ans. (B)  

43. Addition of hydrogen or removal of oxygen in a chemical reaction is called.
   a) Reduction
   b) Extraction
   c) Purification
   d) Hydrogenation
   Ans. (A)  

45. Which gas is used in filling weather balloons.
   a) Helium
   b) Nitrogen
   c) Hydrogen
   d) Oxygen
   Ans. (C)  

46. In a hydride ion the outer most shell has.
   a) One electron
   b) One electron pair
   c) Three electrons
   d) No electron
   Ans. (B)  

47. The nucleus of deuterium contains.
   a) One proton only
   b) One proton and one neutron
   c) One proton and two neutrons
   d) One neutron only
   Ans. (B)  

48. A loss of electron is also called.
   a) Oxidation
   b) Reduction
   c) Electrolysis
   d) Valency
   Ans. (A)  

49. Oxyhydrogen flame gives a temperature of.
   a) 400°C
   b) 1000°C
   c) 2000°C
   d) 4000°C
   Ans. (D)
51. The pink color of KMnO₄ is discharged by zinc and dilute HCl due to the process of.
   a) Reduction  
   b) Both oxidation and reduction
   c) Oxidation  
   d) No oxidation and reduction

52. A boy filled three balloons with different gases. One of the balloons flew at the highest, the gas contained in it was.
   a) Oxygen  
   b) Nitrogen
   c) Helium  
   d) Hydrogen

53. The element of which group maintained below would be expected to form compounds of formula MH₂ type.
   a) Group 1A  
   b) Group 11A
   c) Group 111A  
   d) Group 1VA

54. During the electrolysis of 18 gm of actified water hydrogen released at cathode at S.T.P is.
   a) 18 liters  
   b) 22.4 liters
   c) 11.2 liters  
   d) 1 liter

55. Hydrides of alkaline earth metals are.
   a) Covalent  
   b) Ionic
   c) Coordinate covalent  
   d) Polar

56. The atomic weights of isotopes of an element are different due to difference in number of.
   a) Protons only  
   b) Neutrons only
   c) Electrons and protons  
   d) Electrons only

57. The boiling point of hydrogen is
   a) -100°C  
   b) 259°C
   c) -359°C  
   d) -252°C
639. $^1_H^1$ is the symbol of
a) Deuterium  
   b) Tritium  
   c) Protium  
   d) None of these  
   C

640. The freezing point of hydrogen is
a) $-259^\circ C$  
   b) $-352^\circ C$  
   c) $-252^\circ C$  
   d) $-152^\circ C$  
   A

643. Hydrogen forms covalent compounds with
a) Halogens  
   b) Isotopes  
   c) Alkali metals  
   d) None of these  
   A

645. How many electrons are permissible in K-shell
a) A great number  
   b) Four  
   c) Three  
   d) Two  
   D

646. Hydrogen dissociates into hydrogen atom by
a) Lower temperature  
   b) Ordinary temperature  
   c) High temperature  
   d) All of the above  
   C

647. Ionic hydrides are usually
a) Easily reduced  
   b) Liquids at room temperature  
   c) Good reducing agents  
   d) Good electrical conductor are in solid state  
   C

648. The addition of hydrogen to a molecule is called
a) Halogen  
   b) Reduction  
   c) Hydrogenation  
   d) None of these  
   C

649. $^1_H^3$ is the symbol of
a) Tritium  
   b) Protium  
   c) Deutrium  
   d) None of these  
   C

651. Bond energy of $H_2$ is
a) 430 J/mole  
   b) 520 kJ/mole  
   c) 1312 kJ/mole  
   d) 435 kJ/mole  
   D

652. $^1_H^3$ is the symbol of
a) Tritium  
   b) Protium  
   c) Deutrium  
   d) None of these  
   A

653. Tritium nucleus has
a) one proton and three neutrons  
   b) one neutron and two protons  
   c) one proton and two neutrons  
   d) one proton and two electrons  
   C

654. Which gas is used in filling weather balloons
a) oxygen  
   b) Hydrogen  
   c) Helium  
   d) Nitrogen  
   B

655. The $D_2O$ is commonly known as
a) Soft water  
   b) Heavy water  
   c) Deuterium  
   d) None of these  
   B

656. Most abundant compound of Hydrogen is
a) $NH_3$  
   b) $CH_4$  
   c) $H_2S$  
   d) $H_2O$  
   D

659. Hydrogen is commercially prepared by the thermal composition of
a) Cellulose  
   b) $NaCl$  
   c) Methane  
   d) Ethyne  
   C

661. Hydrogen burns in air with a
a) Violet flame  
   b) Red flame  
   c) Blue flame  
   d) None of these  
   C
HYDROGEN

663. Hydrogen liquefies at
   a) 252°C   b) -252°C   c) -152°C   d) 152°C
   Answer: B

664. Hydrogen occurs in
   a) Four isotopic form   b) Three isotopic form   c) two isotopic form   d) one isotopic form
   Answer: B

665. Hydrogen reacts with halogens to give
   a) Hydrogen sulphides   b) Hydrogen halides   c) Hydrogen hydrides   d) None of these
   Answer: B

666. Covalent Hydrides generally exists in
   a) Liquid state   b) Solid state   c) Gaseous state   d) None of these
   Answer: C

667. During electrolysis hydrogen is deposited at
   a) cathode   b) Anode   c) Both cathod and anode   d) None of these
   Answer: A

668. NaH is an example of
   a) Interstitial hydride   b) Complex hydride   c) Ionic hydride   d) Covalent hydride
   Answer: C

669. Ionic hydrides are usually
   a) Liquid at room temperature   b) Good reducing agent   c) Bad reducing agent   d) Good electric conductor
   Answer: B

670. Hydrogen is used in the manufacture of
   a) Oxygen   b) Carbon-dioxide   c) Fertilizer   d) None of these
   Answer: C

671. Hydrogen reacts on heating with Phosphorus directly to form
   a) H₂ + CO₂   b) H₂S   c) PH₃   d) None of these
   Answer: C

672. The radioactive isotope of hydrogen is
   a) Hydrogen   b) Protium   c) Deuterium   d) Tritium
   Answer: D

673. Which of the following metals cannot liberate hydrogen from dilute hydrochloric acid
   a) Zn   b) Mg   c) Fe   d) Cu
   Answer: D

680. Nitric acid (conc.) oxidizes phosphorus to
   a) H₃PO₄   b) P₂O₅   c) H₃PO₃   d) H₃P₂O₇
   Answer: A

681. The oxidation number of oxygen in hydrogen peroxide is
   a) +1   b) -1   c) +2   d) -2
   Answer: B

693. Hydrogen may be readily prepared by the action of water on
   a) iron   b) HCl   c) zinc   d) sodium
   Answer: D

694. Ionic hydrides are usually
   a) liquids at room temperature   b) good reducing agents   c) good electrical conductor when solid   d) easily reduced
   Answer: B

695. The following two molecules have practically the same mass
   a) H₂O and D₂O   b) H₂O and HOT   c) D₂O and HOT   d) DOT and HOD
   Answer: C
CHEMISTRY-XII

HYDROGEN

Chapter 2

696. which one has lowest boiling point
a) NH₃  b) PH₃
  c) AsH₃  d) SbH₃

698. A tritium nucleus has
a) one proton and two electrons  b) one proton and two neutrons
  c) one neutron and two protons  d) one proton and three neutrons

699. H₂O is
a) more polar than H₂S  b) less polar than H₂S
  c) more or less identical in polarity with H₂S  d) none of the above

700. Which of the following is the strongest base
a) NH₃  b) PH₃
  c) AsH₃  d) SbH₃

704. The symbol of hydride ion is
a) H  b) H⁻
  c) H  d) H⁻

705. The boiling point of water is
a) 100°C  b) 212°F
  c) 80° R  d) All the above are correct

708. What is the commonest gas in the atmosphere
a) He  b) N₂
  c) NH₃  d) H₂

709. D₂O will have maximum density at
a) 9°C  b) 11.5°C
  c) 15.9°C  d) 20°C

711. The element which does not form salt-like hydride is
a) sodium  b) calcium
  c) zinc  d) silicon

- 9 -
1. In the solvay process good yield of sodium bicarbonate is obtained at the temperature of.
   a) 150°C  
   b) 200°C  
   c) 250°C  
   d) None of the above

2. Sodium is prepared by the electrolysis of.
   a) NaOH  
   b) Na₂CO₃  
   c) NaCl  
   d) None of the above

3. In alkali metal series which of the following is most reactive.
   a) Li  
   b) Na  
   c) K  
   d) None of the above

4. Caustic soda is manufactured by.
   a) Lechlanche cell  
   b) Nelson cell  
   c) Downs cell  
   d) None of the above

5. How many electrons are there in the valence orbital(s) of alkali metals?
   a) Zero  
   b) One  
   c) Two  
   d) One or two

6. Sodium forms.
   a) Super oxide  
   b) Peroxide  
   c) Normal oxide  
   d) None of the above

7. On the basis of atomic number alkali metal elements can be arranged in the order.
   a) Li, Na, K, Rb, Cs, Fr  
   b) Li, Na, K, Cs, Rb, Fr  
   c) Li, Na, K, Cs, Fr, Rb  
   d) None of the above

8. Which of the following is the electronic configuration of sodium?
   a) 1s², 2s¹ or [He] 2s¹  
   b) 1s², 2s²p⁶ 3s¹ or [Ne] 3s¹  
   c) 1s², 2s²p⁶, 3s²p⁶, 4s¹ or [Ar] 4s¹  
   d) 1s², 2s²p⁶  

9. The solvent used in extraction of aluminums from its ore is.
   a) Bauxite  
   b) Chromite  
   c) Cryolite  
   d) Anhydrite

10. Alkali metals are _______ conductors of heat and electricity.
    a) Good  
    b) Bad  
    c) Slow  
    d) Fast

11. The elements in which electrons enter in the s-orbital are called.
    a) S-block element  
    b) P-block element  
    c) F-block element  
    d) D-block element

12. Which two of the following elements have wide application in transistor industry?
    a) Silicon and germanium  
    b) Tungsten and platinum  
    c) Iridium and platinum  
    d) Carbon and germanium
25. The brown gas is formed when metals reduce HNO₃ is.
   a) NO₂  
   b) N₂O₃  
   c) N₂O₄  
   d) N₂O₅  
   B

26. In the Oswald’s process which substance is used to oxidize NH₃?
   a) O₂  
   b) NO₂  
   c) P₄O₁₀  
   d) P₂N₆  
   A

27. Which of the following is paramagnetic?
   a) NH₂OH  
   b) NO₂  
   c) N₂O₃  
   d) N₂H₄Cl₂  
   B

28. Which one of the following element does not show allotropy?
   a) Sb  
   b) Bi  
   c) As  
   d) P  
   B

29. The large deposits of sulphur in nature are found as.
   a) Suplhurous acid  
   b) Sulphuric acid  
   c) Free sulphur  
   d) Hydro sulphuric acid  
   C

30. Sulphur burns in the air to produce.
   a) SO₂  
   b) S₂O₃  
   c) H₂SO₃  
   d) SO₃  
   A

31. What is the color of bleaching powder?
   a) Blue  
   b) Yellowish white  
   c) Green  
   d) Red  
   B

32. Calcium sulphate is found both in the hydrated and anhydrous states, in the hydrated state it is more common and is called.
   a) Gypsum  
   b) Sodium  
   c) Barium  
   d) Beryllium  
   A

33. Gypsum becomes anhydrous at.
   a) 300°C  
   b) 200°C  
   c) 150°C  
   d) 195°C  
   B

34. Plaster of Paris is a _________ calcium sulphate.
   a) Hemihydrate  
   b) Dihydrate  
   c) Anhydrite  
   d) None of the above  
   A

35. Plaster of Paris is obtained from.
   a) Epsom  
   b) Gypsum  
   c) Sodium  
   d) All of the above  
   B

36. Each molecule of plaster of Paris contains.
   a) Two water molecules  
   b) One water molecules  
   c) Half water molecules  
   d) Three water molecules  
   C

37. Hydrate calcium sulphate is commonly known as.
   a) Gypsum  
   b) Epsom  
   c) Sodium  
   d) Lithium  
   A

38. Anhydrous sodium carbonate is also called.
   a) Soda ash  
   b) Cake salt  
   c) Baking soda  
   d) Caustic soda  
   A

39. Which of the following is the most powerful oxidizing agent.
   a) Cl₂  
   b) Br₂  
   c) F₂  
   d) I₂  
   C

40. At ordinary temperature sodium reacts with air or oxygen to form.
   a) Sodium oxide  
   b) Sodium peroxide  
   c) Sodium sulphide  
   d) None of the above  
   A
53. Sodium acts as.
   a) Strong reduction agent  
   b) Weak reducing agent
   c) Ordinary reducing agent  
   d) None of the above

55. Sodium acetylide is formed, when acetylene gas is passed through molten sodium at ________.
   a) 110º C  
   b) 200º C
   c) 300º C  
   d) 100º C

56. Sodium Amalgam is an alloy of.
   a) Sodium and mercury metals  
   b) Sodium and lead metals
   c) Titanium and Zirconium metals  
   d) All of the above

57. Rock-salt is obtained directly from the digging of mines. It contains about________ NaCl.
   a) 75%  
   b) 85%
   c) 95%  
   d) 80%

58. The largest deposits of rock-salt in the world are Khewra salt mines. Khewra is located in ________.
   a) Pakistan  
   b) Iran
   c) India  
   d) Afghanistan

61. During the electrolysis of NaOH, oxygen gas is produced at the________.
   a) Cathode  
   b) Anode
   c) Cathode as well anode  
   d) None of the above

62. Baking soda is.
   a) Na₂CO₃  
   b) K₂CO₃
   c) NaHCO₃  
   d) NaOH

65. Washing soda is.
   a) Na₂CO₃  
   b) Na₂CO₃ .10H₂O
   c) NaOH  
   d) Na₂CO₃ .H₂O

66. The atomic and ionic radii ________ from Be to Ra.
   a) Increase  
   b) Decrease
   c) Neither increase nor decrease  
   d) Sometimes increase sometimes decrease

67. Alkali metals are.
   a) Strongest electro positive metals  
   b) Weakest electro positive metals
   c) Ordinary electro positive metals  
   d) None of the above

68. Alkali metals are strongly__________.
   a) Reduction agent  
   b) Oxidizing agent
   c) Both of them  
   d) None of them

69. The oxidation state of alkaline metals are ____________.
   a) +1  
   b) +2
   c) +3  
   d) -2

70. The oxidation state of alkaline earth metals are ____________.
   a) +1  
   b) -1
   c) +2  
   d) -2

72. Alkali metals are ____________.
   a) High reactive  
   b) Least reactive
   c) Ordinary reaction  
   d) None of the above

73. Which pair of atomic numbers represents elements of s block?
   a) 5,19  
   b) 7, 17
   c) 12, 37  
   d) 3, 15

74. An element X forms an oxide X₂O₃ , which of the following compounds contains X.
   a) MgCl₂  
   b) NaCl
   c) AlCl₃  
   d) CCl₄
57. Ca"++ ions are more hydrate than Na" ions because these are ________.
   a) Larger in size
d) Smaller in size
   b) Smaller in size
c) Divalent positively charged
d) Small and divalent positively charged
   c) Divalent positively charged

58. Potassium can displace Na from NaCl due to ________.
   a) Greater I.P. of K
d) Greater I.P. of Na
   b) Greater I.P. of Na
c) More electro positively of K
d) More electro positively of Na
   c) More electro positively of Na

59. The common salt used in our daily life is ________.
   a) Sodium carbonate
d) Sodium sulphate
   b) Sodium hydro oxide
c) Sodium chloride
   c) Sodium chloride

60. One would like to install the bleaching powder manufacturing industry where ________.
   a) Mg salts are available
d) Silica is available
   b) Ca salts are available
c) Na salts are available
   d) Silica is available
   c) Na salts are available

61. The commercial name of CaO is ________.
   a) Lime
d) Lime stone
   b) Gypsum
c) Marble
   c) Lime stone

62. Common dehydrating agent used in laboratory is ________.
   a) MgCO₃
d) CaF₂
   b) CaCl₂
c) MgF₂
   c) CaCl₂

63. A method used for the preparation of sodium metal is named after the name of the scientist who devised it. Who is he?
   a) Crius
d) Haber
   b) Down
c) Schmidt
   d) Haber
   d) Schmidt

64. Which element does not belong to alkaline earth metals.
   a) Mg
d) Rb
   b) Sr
c) Ca
d) Rb
   c) Sr

65. Francium is the most electro positive element in its family due to the fact that ________.
   a) Its incomplete shell is nearest to the nucleus
d) It exerts more attractive force on valence electron
   b) Valence electrons have a larger orbital than valence electron of other elements
   c) It is heavier element
   d) It exerts more attractive force on valence electron
   d) It exerts more attractive force on valence electron

66. LiCl is more soluble in organic solvents than NaCl because.
   a) Li" has higher heat of hydration than Na"
d) LiCl is more covalent than NaCl
   b) Li" has lower heat of hydration than Na"
c) LiCl is more covalent than NaCl
   d) Lattice energy of NaCl is less than that of LiCl
   c) LiCl is more covalent than NaCl

67. One of the products during electrolysis of NaCl solution is ________.
   a) NaClO
d) NaClO₃
   b) NaOH
c) Na (d) NaClO₃
   d) NaClO₃

68. In elements of IIA group which of the following properties decrease at the atomic number increases?
   The correct answer is ________.
   a) I and II
d) I, II and IV
   b) I, II and IV
c) II, III and IV
d) I, II and III
   d) I, II and III

69. When sodium carbonate is manufactured by Solvay’s process NaHCO₃ is precipitated due to ________.
   a) More solubility
d) More solubility of CO₂ and NH₃
   b) Less solubility
c) More solubility of NaCl
   d) More solubility of CO₂ and NH₃
   b) Less solubility
94. The energy required to remove an electron from a gaseous atom to from a gaseous positive ion is called.
   a) Ionization energy
   b) Electron affinity
   c) Electro negativity
   d) Electro positivity
   A

97. Out of the following soda ash is.
   a) Na₂CO₃
   b) Na₂CO₃ . 10H₂O
   c) NaHCO₃
   d) NaOH
   A

98. The chemical used for production of CO₂ in the first extinguishers are.
   a) NaOH and dil. Acid
   b) Na₂CO₃ and dil. Acid
   c) NaHCO₃ and dil. Acid
   d) CaCO₃ and dil. Acid
   C

100. Sodium carbonates and sodium bicarbonates are obtained by.
    a) Haber process
    b) Solvey process
    c) Castner Killer process
    d) Nelsons cell
    B

102. The formula of plaster of Paris is.
     a) CaSO₄ . 2H₂O
     b) CaSO₄ . H₂O
     c) CaSO₄ . 3H₂O
     d) CaSO₄ . ½ H₂O
     D

104. S and p block element are called.
     a) Normal elements
     b) Transition elements
     c) Metals
     d) Non-metals
     A

727. In the alkali metal series, calcium is the most reactive metal because
     a) its incomplete shell is nearest to the nucleus
     b) the valence electron has a larger orbit than the orbit of the valence electron of any of the others
     c) it exerts considerable attractive force on the valence electrons
     d) it is heavier metal
     B

729. Potassium hydride contains
     a) covalent bond
     b) metallic bond
     c) ionic bond
     d) coordinate bond
     C

730. An apparatus used for commercial preparation of sodium is named after
     a) Carius
     b) Down
     c) Schmidt
     d) Haber
     B

731. Baking soda is also called
     a) caustic soda
     b) soda ash
     c) washing soda
     d) bicarbonate of soda
     D

732. Which does not belong to alkali metals
     a) Li
     b) Na
     c) K
     d) Ra
     D

733. A graphite anode is used in Down’s cell for the production of sodium because
     a) it does not react with sodium
     b) it does not react with chlorine
     c) it is easy to fashion in circular form
     d) it floats on the fused sodium
     B

734. Which one is a reducing agent as and a constituent of gun powder
     a) KNO₃
     b) C
     c) CaCO₃
     d) Na
     A

735. Atoms of alkali metals are attached by
     a) Covalent bonds
     b) Ionic bonds
     c) Metallic bonds
     d) electrons
     C

738. which of the following is strongest base
     a) Li (OH)
     b) Be
     c) KOH
     d) RbOH
     D
### S-BLOCK ELEMENTS

**Chapter 3**

739. Of all the group 11 elements, the highest oxidation potential is for
   a) Li  
   b) Be  
   c) Ba  
   d) Ra  
   Of all the group 11 elements, the highest oxidation potential is for **D**

741. Which of the following under goes disproportion
   a) $\text{Ba}^{2+}$  
   b) $\text{Ba}^+$  
   c) $\text{BaCl}_2$  
   d) $\text{BaH}_2$  
   The hydration energy of $\text{Mg}^{2+}$ is larger than that of **B**

742. The hydration energy of $\text{Mg}^{2+}$ is larger than that of
   a) $\text{Al}^{3+}$  
   b) $\text{Be}^{2+}$  
   c) $\text{Mg}^{+3}$  
   d) $\text{Na}^+$  
   Temporary hardness of water can be removed by the addition of **D**

744. Which one has the highest lattice energy
   a) $\text{Be(OH)}_2$  
   b) $\text{Mg(OH)}_2$  
   c) $\text{Ca(OH)}_2$  
   d) $\text{Ba(OH)}_2$  
   When $\text{CO}_2$ is bubbled into an aqueous solution of $\text{Na}_2\text{CO}_3$ the following is formed **A**

746. Temporary hardness of water can be removed by the addition of
   a) $\text{CaCO}_3$  
   b) $\text{Ca(OH)}_2$  
   c) $\text{CaCl}_2$  
   d) $\text{CaF}_2$  
   A dehydrating agent commonly used in the laboratory is **C**

748. Which of the following is not produced during Solvay process
   a) $\text{CO}_2$  
   b) $\text{CaO}$  
   c) $\text{CaCl}_2$  
   d) All are produced  
   The most abundant source of $\text{CaCO}_3$ is **C**

750. When $\text{CO}_2$ is bubbled into an aqueous solution of $\text{Na}_2\text{CO}_3$ the following is formed
   a) $\text{NaOH}$  
   b) $\text{HCO}_3^-$  
   c) $\text{H}_2\text{O}$  
   d) $\text{OH}^-$  
   A dehydrating agent commonly used in the laboratory is **C**

752. Who discovered radium
   a) Kloprath  
   b) Fermi  
   c) Curies  
   d) Rutherford  
   The most abundant source of $\text{CaCO}_3$ is **C**

755. Bleaching power is obtained by passing chlorine over
   a) $\text{CaCO}_3$  
   b) $\text{Ca(OH)}_2$  
   c) $\text{Na}_2\text{CO}_3$  
   d) $\text{Ca(HCO}_3)_2$  
   Bleaching power is obtained by passing chlorine over **B**
11. Boron has ______ ionization potential value.
   a) High           b) Low
   c) Complex        d) Simple
A
12. The formula for borax is __________
   a) Na₂CO₃          b) Na₂B₂O₄·10H₂O
   c) B₂O₃            d) H₃BO₃
B
13. Borax is used in making__________
   a) Water          b) Hydrogen gas
   c) Manufacture of optical & hard glass d) None of these
C
14. The formula for orthoboric acid is __________
   a) H₂BO₃           b) H₃BO₃
   c) H₂SO₄           d) NaOH
B
15. The chemical equation, when orthoboric acid reacts with “Na₂CO₃” is __________
   a) Na₂B₂O₄ + CO → 2NaBO₂ + CO(BO₂)₂
   b) 4H₃BO₃ + Na₂CO₃ → Na₂B₂O₄ + CO₂ + 6H₂O
   c) H₂BO₃ + 3C₂H₅OH → B(OC₂H₅)₃ + 3H₂O
   d) None of these
B
16. The heat energy for reaction 4Al + 3O₂ → 2Al₂O₃ is __________
   a) \( \Delta H = -798.18 \text{ K cal/m} \)
   b) \( \Delta H = 9310 \text{ K Cal/m} \)
   c) \( \Delta H = +798.18 \text{ K cal/m} \)
   d) None of these
A
17. When aluminum reacts with dil. HCl then __________ gas is produced
   a) Hydrogen
   b) Nitrogen
   c) Oxygen
   d) None of these
A
18. When aluminum reacts with chlorine then __________ is formed
   a) SO₂
   b) AlCl₃
   c) Al (OH)₃
   d) CH₄
B
19. "Al" is a __________ metal
   a) Dissolving
   b) Lighter
   c) Slow
   d) None of these
B
20. Alums are used for the __________ of hard water.
   a) Sizing
   b) Purification
   c) Cotton
   d) None of these
B
21. The carbon has __________ allotropic forms.
   a) Two
   b) Three
   c) Four
   d) Five
A
22. Diamond is the __________ substance.
   a) Inert
   b) Coke
   c) Hardest
   d) Soft
C
23. The melting point of carbon is very __________
   a) High
   b) Low
   c) Graphite
   d) Increases
A
24. At 20°C, the diamond has __________ density.
   a) 441.9 gm/cm³
   b) 3.51 gm/cm²
   c) 571. gm/cm³
   d) 751 gm/cm³
B
25. Diamond has __________ refractive index.
   a) Slow
   b) Less
   c) High
   d) Heat
C
30. Diamond is used for the _________ of glass.
   a) Cutting  
   b) Electricity  
   c) Room temperature  
   d) Drilling  
31. Graphite has _________ density at 20°C.
   a) 471.5 gm/cm³  
   b) 2.2 gm/cm³  
   c) 9.41 gm/cm³  
   d) None of these  
32. When “C” burns with “O₂” at 700°C then _________ gas is obtained
   a) CO₂  
   b) CO  
   c) CaCO₃  
   d) CF₄  
34. The formula for lead monoxide is _________
   a) PbO  
   b) PbS  
   c) PbCl₃  
   d) None of these  
35. PbO + H₂ → ________.
   a) PbH₂ + O₂  
   b) Pb + H₂O  
   c) Pb + CO  
   d) Pb + CO₂  
36. The chemical formula for sindhur is __________
   a) Pb₃O₄  
   b) Pb₂O₃  
   c) PbO  
   d) Pb₃O₅  
37. The formula for white lead is ___________
   a) Pb₂O₃  
   b) 2PbCO₃ · Pb(OH)₂  
   c) 3PbCO₃ · 4Pb(OH)₂  
   d) None of these  
38. White lead is an __________ powder.
   a) Amorphous  
   b) Black  
   c) Colour  
   d) Unreactive  
40. By the process of Ostwald, we can get __________ pure HNO₃.
   a) 98%  
   b) 100%  
   c) 50%  
   d) 68%  
41. The boiling point of “HNO₃” is ________
   a) 38°C  
   b) 96°C  
   c) 83°C  
   d) 98°C  
42. Monoclinic sulphur is soluble in ________
   a) CO₂  
   b) Carbon disulphide  
   c) Benzene  
   d) None of these  
43. C₆H₁₂O₆
   a) 6C + 6H₂O  
   b) 6CO + 6H₂  
   c) 6CO + H₂  
   d) None of these  
44. β - sulphur has __________ structure
   a) Simple  
   b) Monoclinic  
   c) Astatine  
   d) Copper like  
45. “H₂SO₄” is a strong __________ acid.
   a) Diprotic  
   b) Monoclinic  
   c) Simple  
   d) None of these  
01. The p-block elements includes subgroups III-A to:
   a) VI-A  
   b) VIII-A  
   c) VIII-A  
   d) VIII-B  
02. Each period of p-block contain __________
   a) Five elements  
   b) Six elements  
   c) Eight elements  
   d) Seven elements
03. The tendency of a pair of ……….. to remain inert during chemical bonding is called inert pair effect.
   a) Electron          b) Proton
   c) Neutron           d) Nucleus

04. Group III-A consists of boron, aluminum, gallium, indium and ……….. 
   a) Bismuth           b) Germanium
   c) Selenium          d) Thallium

09. Aluminium reacts slowly with dil. H$_2$SO$_4$ to produce:
   a) Nitrogen gas      b) Oxygen gas
   c) Hydrogen gas      d) Sulph dioxide gas

10. R$_2$SO$_4$. M$_2$(SO$_4$)$_3$.24H$_2$O, where R is a monovalent and M is a trivalent metal ion, is the general formula of:
   a) Potash            b) Alums
   c) Borax             d) Washing soda

11. The process of fixing the dye firmly to the fabric by the use of alums is called:
   a) Mordanting        b) Fixation
   c) Fix dying         d) Firm dying

12. Group IV-A consists of elements, carbon, silicon, germanium, tin and ……….. 
   a) Phosphorus        b) Zinc
   c) Antimony          d) Lead

13. ……………. is the property due to which more than two atoms of the same elements are held together through strong covalent bonds to form long strings of atoms.
   a) Allotropy         b) Hydration
   c) Metamorphosis     d) Catenation

14. A phenomenon in which an element is found in more than one forms having the same chemical properties is called:
   a) Isotopy           b) Allotropy
   c) Catenation        d) Normality

15. The known hardest substance is:
   a) Ceramics          b) Iron
   c) Diamond           d) Graphite

16. Nitrogen molecules contain:
   a) Triple covalent bond b) Double covalent bond
   c) Single covalent bond d) Single ionic bond

17. The commercial preparation of nitric acid from ammonia is by the:
   a) Birkland’s process b) Ostwald’s process
   c) Eyde’s process     d) Haber process

18. Aqua regia is a solution of one part by volume of conc. HNO$_3$ and three parts by volume of conc. ………..
   a) H$_2$SO$_4$         b) CH$_3$COOH
   c) HCl               d) HCOOH

19. Aqua regia is used as solvent for noble metals such as:
   a) Au an Pt          b) Cu and Fe
   c) U and W           d) Pb and Sb

20. The number of electrons in the outermost orbit of VI-A group elements is:
   a) Five              b) Four
   c) Three             d) Six

21. Oxygen, sulphur, selenium, tellurium and polonium are elements of group:
   a) VI-A               b) VII-A
   c) V-A                d) IV-A
CHEMISTRY-XII

Chapter 4

p-BLOCK ELEMENTS

22. Oxygen has two allotropic forms i.e., oxygen (O\(_2\)) and:
   a) Tetroxide (O\(_4\))
   b) Ozone (O\(_3\))
   c) Nascent oxygen (O)
   d) Pentoxide (O\(_5\))

23. Crystals of \(\alpha\)-sulphur consists of:
   a) \(S_6\) molecules
   b) \(S_7\) molecules
   c) \(S_8\) molecules
   d) \(S_9\) molecules

24. A unit cell of crystals of sulphur consists of ………… S\(_8\) molecules
   a) Twenty-four
   b) Twelve
   c) Eight
   d) Sixteen

25. Monoclinic sulphur is soluble in :
   a) Water
   b) Alcohol
   c) Benzene
   d) Carbon disulphide

26. Hydrogen sulphide gas in the laboratory for analytical purposes is obtained by the
   a) Glover’s apparatus
   b) Kipp’s apparatus
   c) Pyrite apparatus
   d) Nitre pots

27. Chemical reaction between iron sulphide and dilute sulphuric acid in Kipp’s apparatus
   produces …………
   a) Sulphur dioxide gas
   b) Sulphur trioxide gas
   c) Hydrogen sulphide gas
   d) No gas

28. Hydrogen sulphide is a good:
   a) Reducing agent
   b) Oxidizing agent
   c) Analyzing agent
   d) Sales agent

29. Hydrogen sulphide burns with a:
   a) Blue flame
   b) Golden flame
   c) Green flame
   d) Red flame

30. Sulphuric acid was first prepared in the laboratory by the famous Muslim chemist:
   a) Ibn-i-Rushd
   b) Ibn-i-Sina
   c) Jabbar-bin-Halyan
   d) Al-Beerone

31. “The king of chemicals” is the
   a) Hydrochloric acid
   b) Nitric acid
   c) Sodium chloride
   d) Sulphuric acid

32. 100% \(H_2SO_4\) is called:
   a) Nitre
   b) Oleum
   c) Petre
   d) Sulphite

33. \(H_2SO_4\) dissolves in water with the evolution of:
   a) Bubbles
   b) Heat
   c) Hydrogen gas
   d) Vapours

34. Sulphuric acid is a strong ………… acid.
   a) Monoprotic
   b) Monoelectric
   c) Diprotic
   d) Dielectric

35. ………… and ………… are not attached by dilute or concentrated \(H_2SO_4\)
   a) Cooper and silver
   b) Lead and mercury
   c) Iron and zinc
   d) Platinum and gold

36. \(C_6H_{12}O_6 \xrightarrow{H_2SO_4} \text{………..} + 6 H_2O\)
   a) 6 C
   b) 6 CO\(_2\)
   c) 6 CO
   d) 6\(_6\)H\(_6\)

37. The removal of rust, from metal sheets, with sulphuric acid is called:
   a) Drying
   b) Pickling
   c) Picking
   d) Washing

- 4 -
38. Group VII-A elements are generally called:
   a) Halogens  b) Noble gases  c) Inert gases  d) Metalloids
   Answer: A

39. The radioactive element in halogen group is:
   a) Radon  b) Radium  c) Astatine  d) Bromine
   Answer: C

40. Atomic number of halogens are F(9), Cl(17), Br(35), I(53) and At (……)
   a) 83  b) 87  c) 58  d) 85
   Answer: D

41. Fluorine and chlorine are gases, bromine is a liquid and iodine is a:
   a) Semi-solid  b) Super cooled liquid  c) Crystalline solid  d) Amorphous solid
   Answer: C

42. All the elements of group VIII-A are:
   a) Metals  b) Gases  c) Solids  d) Non-metals
   Answer: D

43. Chlorine gas:
   a) Is odourless  b) Has irritating pungent smell  c) Has sweet apple’s smell  d) Had rotten egg’s smell
   Answer: B

44. Phosphorus burns in limited supply of chlorine to give phosphorus:
   a) Mono chloride  b) Pentachloride  c) Trichloride  d) Hexachloride
   Answer: C

45. Chlorine reacts with large excess of ammonia to liberate ………
   a) Hydrogen  b) Oxygen  c) Methane  d) Nitrogen
   Answer: D

46. Chlorine is used in the extraction of ………
   a) gold  b) Sulphur  c) Silver  d) Copper
   Answer: A

47. β-sulphur has ……… structure
   a) Rhombic  b) Orthorhombic  c) Monochlinic  d) Tetrahedral
   Answer: C

48. Carbon is ……… hybridised in diamond
   a) sp  b) sp²  c) sp³  d) sp³
   Answer: C

759. The elements of group IIIA to group VIII A are called
   a) d-block elements  b) S-block elements  c) p-block elements  d) none of these
   Answer: C

760. Which has highest first ionization energy
   a) B  b) Al  c) Ga  d) In
   Answer: A

761. Which has lowest oxidation potential
   a) B  b) Al  c) Ga  d) In
   Answer: D

762. Which forms the most acidic oxide
   a) B  b) Al  c) Ga  d) In
   Answer: A

763. Choose the substances used to produce red coloration in synthetic rubies
   a) B₂O₃  b) Al₂O₃  c) Na₃AlF₆  d) Cr₂O₃
   Answer: D
CHEMISTRY-XII

Chapter 4

p-BLOCK ELEMENTS

764. The octet rule is not obeyed in
   a) NH₃  
   b) Al(OH)₄  
   c) BF₃H₁₀  
   d) BeI₃

   770 Hydrogen gas may be produced by the reaction of aluminium with a concentrated solution of
   a) Fe₂O₃  
   b) NaOH  
   c) HNO₃  
   d) NaF

   774. Which is most acidic
   a) Na₂O  
   b) MgO  
   c) Al₂O₃  
   d) CaO

   776. Dura lumen is an alloy which contains
   a) Mg + Al  
   b) Cu + Al + Mg + Ni  
   c) Mg + Cu  
   d) Cu + Al

   777. What is corundum
   a) Al₂O₃  
   b) SiC  
   c) ZnSO₄  
   d) H₂PtCl₆

   778. The solvent used in the extraction of aluminium from its ore is
   a) cryolite  
   b) bauxite  
   c) molten sodium chloride  
   d) water

   780. Which one of the following elements bears resemblance with gallium
   a) Si  
   b) Al  
   c) Ni  
   d) As

   781. A product of thermal decomposition of sodium bicarbonate is
   a) NaH  
   b) CO₂  
   c) NaHCO₃  
   d) C₂H₂

   782. Moderate electrical conductivity is exhibited by
   a) SiO₂  
   b) Graphite  
   c) diamond  
   d) CO₂

   787. Poisonous gas present in the exhaust fumes of car is
   a) CH₄  
   b) C₂H₂  
   c) CO  
   d) CO₂

   789. The compound which contains both ionic and covalent bonds is
   a) CH₄  
   b) H₂  
   c) KCN  
   d) K

   790. On heating with conc. H₂SO₄ sucrose gives
   a) Co and CO₂  
   b) Co and SO₂  
   c) Co, CO₂ and SO₂  
   d) none of the above

   791. Lead tetraethyl is used as
   a) fire extinguisher  
   b) Pain killer  
   c) petroleum additive  
   d) mosquito repellent

   792. Litharge is chemically
   a) PbO  
   b) PbO₂  
   c) Pb₃O₄  
   d) Pb(CH₃COO)₂

   793. Which is the most abundant element in earth’s crust
   a) Ca  
   b) Si  
   c) C  
   d) O

   797. Phosphine may be produced by the action of water on
   a) Ca₃P₂  
   b) P₂O₆  
   c) P₄O₁₀  
   d) HPO₃
798. Which of the following dissolves in water to give a basic solution
a) $H_3PO_3$  
 b) $NaH_2PO_4$  
 c) $Na_3HPO_4$  
 d) $NaNO_3$  
 C

806. Large deposits of sulphur in nature are found as
a) sulphuric acid  
 b) sulphurous acid  
 c) hydrosulphuric acid  
 d) free sulphur  
 D

808. The form of sulphur which is stable at room temperature and normal atmospheric pressure
a) orthorhombic  
 b) hexagonal  
 c) monoclinic  
 d) amorphous  
 A

812. Pyrosulphuric acid may be synthesized by dissolving $SO_3$ in
a) $H_2O$  
 b) $H_2S_2O_3$  
 c) $H_2SO_4$  
 d) $H_2S_2O_8$  
 C

814. choose the substance used as a catalyst in the contact process
a) $Fe_2O_3$  
 b) $V_2O_5$  
 c) $SO_3$  
 d) $Ag_2O$  
 B

816. Choose the stongest acid
a) $H_2S$  
 b) $H_2SO_4$  
 c) $CH_3COOH$  
 d) $H_3PO_4$  
 B

817. A compound in which oxygen has a positive oxidation state is
a) $H_2O$  
 b) $Na_2S_2O_3$  
 c) $ClO_2$  
 d) $OF_2$  
 D

818. Which of the following has the highest catenation capability
a) oxygen  
 b) sulphur  
 c) carbon  
 d) tellurium  
 C

821. The halogen with the highest ionization potential is
a) F  
 b) Cl  
 c) I  
 d) At  
 A

823. Hypobromous acid is
a) $HOBr$  
 b) $HOBrO$  
 c) $HOBrO_2$  
 d) $HOBrO_3$  
 A

824. Hydrofluoric acid is
a) a powerful oxidizing agent  
 b) a weak acid  
 c) a strong acid  
 d) good reducing agent  
 B

825. Which one is least soluble in water
a) $NaF$  
 b) $CaF_2$  
 c) $AgF$  
 d) $HF$  
 B

826. Which of the following is most powerful oxidizing agent
a) $F_2$  
 b) $Cl_2$  
 c) $Br_2$  
 d) $I_2$  
 A

827. Which one has the highest electronegativity
a) F  
 b) Cl  
 c) Br  
 d) I  
 A

828. Which of the following exhibits the highest bond energy
a) $F_2$  
 b) $Cl_2$  
 c) $Br_2$  
 d) $I_2$  
 B

831. Concentrated $H_2SO_4$ can be used to prepare $HBr$ from $NaBr$, but it usually is not because
a) it oxidizes $HBr$  
 b) it reduces $HBr$  
 c) it reacts too slowly with $NaBr$  
 d) it causes the $HBr$ to disproportionate  
 A
### p-BLOCK ELEMENTS

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
<th>Correct Answer</th>
</tr>
</thead>
</table>
| 832. Which has the lowest boiling point | a) $F_2$  
b) $Cl_2$  
c) $Br_2$  
d) $I_2$ | A |
| 833. Which of the following has a pyramidal structure | a) $ClO_2$  
b) $ClO_2^-$  
c) $ClO_3$  
d) $NaClO_4$ | C |
| 834. Which of the following forms the most basic 0.1 M solution | a) $NaCl$  
b) $NaOCl$  
c) $NaClO_2$  
d) $NaClO_3$ | B |
| 835. Which one is the highest melting halide | a) $NaCl$  
b) $NaBr$  
c) $NaF$  
d) $NaI$ | C |
| 836. Which one does not form its oxy acid | a) Fluorine  
b) Bromine  
c) Chlorine  
d) Iodine | A |
| 837. The colour of $I_2$ solution can be discharged by shaking with aqueous solution of | a) Sulphur dioxide  
b) Sodium thiosulphate  
c) Sodium sulphite  
d) Sodium sulphate | B |
| 838. Bleaching powder is obtained by the interaction of $Cl_2$ and | a) A dil. Solution of $Ca(OH)_2$  
b) Conc. Solution of $Ca(OH)_2$  
c) Dry $CaO$  
d) Dry slaked lime | B |
01. The element in which ‘d’ or ‘f’ orbitals are incomplete either in the atomic state or in their common ions are called.
   a) Transuranium elements  b) Transition elements  c) Lanthanides  d) Actinides
   B

02. Transition elements have …………
   a) Four series  b) Two series  c) Three series  d) Five series
   A

03. The incomplete orbital of 1st series of transition elements i.e. Sc(21) to Zn (30) is.
   a) 3d  b) 4d  c) 5d  d) 5f
   C

05. In the periodic table the transition elements are placed in the sub-groups.
   a) I-A to VIII-A  b) III-A to VIII-A  c) I-B to VIII-B  d) III-B to VIII-B
   A

07. There are about ……….. transition elements out of 110 discovered so far.
   a) 65  b) 60  c) 55  d) 50
   B

09. The atomic and ionic radii ……….. from left to right in the transition series.
   a) Increases  b) Decreases  c) Remains same  d) Fluctuates
   B

11. The color of Mn^{2+} in hydrated form is.
   a) Green  b) Blue  c) Light pink  d) Yellow
   C

12. The color of Ni^{2+} in hydrated form is.
   a) Pink  b) Grassy green  c) Yellow  d) Blue
   B

13. Iron oxide is used as a catalyst in the.
   a) Constant process  b) Catalytic hydrogenation  c) Ostwald’s process  d) Haber process
   D

14. The substance which are attracted by a magnetic field are called…………… substances.
   a) Para magnetic  b) Diamagnetic  c) Ferromagnetic  d) Electromagnetic
   A

15. The substance containing unpaired electrons show …………. property.
   a) Diamagnetic  b) Ferromagnetic  c) Paramagnetic  d) Electromagnetic
   C

18. Iron and cobalt are………….. substances.
   a) Ferromagnetic  b) Diamagnetic  c) Paramagnetic  d) Electromagnetic
   A

19. The substances which can be magnetized permanently are called………….. substance.
   a) Paramagnetic  b) Ferromagnetic  c) Diamagnetic  d) Actomagnetic
   B

20. The transition elements and their compounds are …………. in nature.
   a) Orthomagnetic  b) Metamagnetic  c) Paramagnetic  d) Electromagnetic
   C

21. A single or an unpaired electron behaves like a small.
   a) Silver  b) Stone  c) Power house  d) Magnet
   D

24. The empty spaces between the atoms of metal inside their crystal lattices are called.
   a) Interons  b) Inter spaces  c) Inter ferons  d) Interstices
   D
25. The compounds formed by diffusion of small atoms in the interstices of crystal structures of transition metals are called.
   a) Addition compounds  b) Interstitial compounds  c) Organic compounds  d) Complex compounds

26. An atom or ion of transition metals surrounded by oppositely charged ions are neutral molecules is called.
   a) Complex compounds  b) Ionic compounds  c) Organic compounds  d) Coordination number of the central atom of complex compounds is the number of
   a) Ions  b) Ligands  c) Anions  d) Extra molecule

27. An ion or neutral molecules surrounding a central atom in complex compounds is called.
   a) Coordinator  b) Ligand  c) Heavy ion

28. Coordination number of the central atom of complex compounds is the number of
   a) Ions  b) Cations  c) Ligands  d) Anions

29. Chalcocite and chalcopyrite are sulphide ores of.
   a) Silver  b) Gold  c) Iron  d) Copper

30. Chalcopyrite (CuFeS₂) contains about………… of Copper
   a) 105%  b) 25%  c) 6%  d) 20%

31. The molten mixture of Cu₂S and ……… is called matte.
   a) ZnS  b) FeS  c) CdS  d) SbS

32. Blistered copper having blisters on the metal surface due to escaping of SO₂ gas during its cooling is about ……… pure.
   a) 90%  b) 99%  c) 95%  d) 80%

33. The impurities, settled down from the blister copper during purification are called.
   a) Cathode mud  b) Electrode mud  c) Anode mud  d) Residual mud

34. Electrolytic copper is.
   a) 98% pure  b) 100% pure  c) 99% pure  d) 99.55% pure

35. Cuprous ion in aqueous solution Cu(H₂O)⁺ is unstable and undergo.
   a) Disproportionation  b) Displacement reaction  c) Fission reaction  d) Fusion reaction

36. Elements in which f-orbitals are in the process of completion are called.
   a) Outer transition elements  b) Inner transition elements  c) Non-transition elements  d) None of the above

37. In the process of tin plating the deposit layer is.
   a) Tin  b) Copper  c) Aluminum  d) None of the above

38. Potassium per magnate may be represented as.
   a) K₂MnO₄  b) KMnO₄  c) K₂MnO₃  d) K₂MnO₂

39. What are alloys?
   a) A homogenous mixture of two or more elements  b) A homogenous mixture of metal and non metal  c) A homogenous mixture of two or more metals or a metal or non metal  d) None of the above
05. An atom containing an odd number of electron shows.
   a) Paramagnetism  b) Diamagnetism  c) Ferro magnetism  d) Hyper magnetism  
   Answer: A

06. In the metallurgy of copper, matter is considered to be a mixture of
   a) FeS and ZnS  b) FeS and Cu₂S  c) Cu₂S and ZnS  d) FeS and CuCO₃
   Answer: B

07. Which of the following elements can be included in the category of transition elements?
   a) Aluminum  b) Argon  c) Astatine  d) Copper
   Answer: D

08. The ability of transition elements to form complexes is due to
   a) Small size of metal ion  b) Highly charged metal ion  c) Availability of empty d or f-orbital  d) All of the above
   Answer: D

09. Nickel is used as a catalyst for.
   a) The manufacture of ammonia  b) Hydrogenation of unsaturated hydro carbons  
      c) Oxidation of SO₂ to SO₃  d) None of the above
   Answer: B

10. The color of chromite hydrated ion is.
    a) Yellow  b) Violet  c) Green  d) Pink
    Answer: C

11. Potassium chromate is.
    a) Yellow crystalline solid  b) Red crystalline solid  
       c) Dark purple crystalline solid  d) None of the above
    Answer: A

12. Bronze is an alloy which contains.
    a) 60 % Cu  b) 70 % Cu  c) 80 % Cu  d) None of the above
    Answer: D

13. Coordination number of K₄[Fe(CN)₆] is.
    a) Six  b) Three  c) Four  d) Two
    Answer: A

    a) CN  b) K  c) Fe  d) C
    Answer: A

15. Silver nitrate react with bromide ion to form precipitate of silver bromide which is.
    a) White color  b) Pale yellow color  c) Deep yellow color  d) Black color
    Answer: B

16. Which of the following is the transition element?
    a) Cr  b) Sr  c) Sn  d) Ca
    Answer: A

17. Which one of following ions is colored?
    a) Al³⁺  b) K⁺  c) Fe⁴⁺  d) None of the above
    Answer: C

18. Which is the important ore of copper?
    a) Bauxite  b) Malachite  c) Baryte  d) Blue vitriol
    Answer: B

19. Bessemer’s converters are used to get.
    a) Aluminum  b) Copper  c) Chromium  d) All of the above
    Answer: B

20. Which of the following does not contain copper?
    a) Blue vitriol  b) Carborundom  c) Azurite  d) None of the above
    Answer: B
21. The substance attracted by magnetic field is called.
   a) Paramagnetic  b) Diamagnetic  c) Antimagnetic  d) None of the above
   A

22. Stainless steel is.
   a) A mixture  b) A compound  c) An element  d) All of the above
   A

23. Which of the following does not belong to d-block elements?
   a) Cobalt  b) Silicon  c) Chromium  d) All of the above
   B

26. The corrosion of metal can be prevented by.
   a) Alloying and removal of strains  b) Paint coating and metallic coating  c) Grease and oil coating  d) All of the above
   B

27. Potassium ferrocyanide is.
   a) A mixture  b) A compound  c) An element  d) All of the above
   C

30. Aluminum resists the process of corrosion because the formation of.
   a) Aluminum nitride  b) Aluminum carbonate  c) Aluminum sulphate  d) Aluminum oxide
   D

31. Which of the following elements is ferromagnetic?
   a) Carbon  b) Calcium  c) Cobalt  d) Pb
   C

32. The elements in which d or f-orbital are incomplete are called.
   a) Transition elements  b) Typical element  c) Both of them  d) None of the above
   A

33. In physical and chemical properties, transition elements show.
   a) Similarities  b) Dissimilarities  c) Both of them  d) Sometimes similarities sometimes dissimilarities
   A

34. K$_2$Cr$_2$O$_7$ is.
   a) Strong oxidizing agent  b) Weak oxidizing agent  c) Strong reducing agent  d) Weak reducing agent
   A

35. K$_2$Cr$_2$O$_7$ oxidizes SO$_2$ to.
   a) Sulphite  b) Sulphate  c) Hydrate  d) None of them
   B

37. An emulsion of silver which is applied to the photographic films is.
   a) Chloride  b) Bromide  c) Iodide  d) None of the above
   B

38. In the silvering of mirrors, glucose is used as.
   a) Oxidizing agent  b) Reducing agent  c) Oxidizing as well as reducing agent  d) None of the above
   B

39. Most of the copper is extracted from.
   a) Chalcocite ore  b) Chalcopyrite ore.  c) Iron ore  d) Cuprite ore
   B

40. The molten mixture of Cu$_2$S and FeS is called.
   a) White metal  b) Matte  c) Cuprite  d) Chalcocite
   B

43. Copper is a ________ conductor of heat and electricity.
   a) Good  b) Bad  c) Normal  d) None of the above
   A
### Chapter 5

**d- BLOCK ELEMENTS (Transition Elements)**

45. Silver bromide is used in photography because it is.
   - a) Heat sensitive
   - b) Light sensitive
   - c) Both of them
   - d) None of them
   **B**

46. Addition of ammonia solution to copper sulphate solution gives.
   - a) Red color
   - b) Yellow color
   - c) Deep blue color
   - d) Yellowish white color
   **C**

47. An alloy of 90% copper and 10% tin is.
   - a) Brass
   - b) Bronze
   - c) Aluminum
   - d) Gold
   **B**

49. A substance which can be magnetized permanently is called.
   - a) Paramagnetic
   - b) Ferromagnetic
   - c) Diamagnetic
   - d) None of the above
   **B**

50. What are formed during the process of corrosion of a metal?
   - a) Oxides
   - b) Chlorides
   - c) Sulphides
   - d) All of the above
   **A**

51. Which is commercially known as hypo?
   - a) Na$_2$S$_2$O$_3$
   - b) Na$_2$SO$_3$
   - c) Both of them
   - d) None of them
   **A**

53. The composition of copper pyrite ore is.
   - a) Cu$_2$S
   - b) Cu$_2$O
   - c) CuFeS$_2$
   - d) None of the above
   **C**

54. The center of coordination in K$_3$Fe(CN)$_6$ is.
   - a) K- atom
   - b) Fe- atom
   - c) C- atom
   - d) N- atom
   **B**

55. Transition element from _______ ions in solution.
   - a) Coloured
   - b) Colourless
   - c) Compact
   - d) None of the above
   **A**

59. The negative film becomes the darkest where the object was _______ and vice versa.
   - a) Dark
   - b) Bright
   - c) Faint
   - d) None of the above
   **B**

### Answers:

- 64. **B**
- 65. **C**
- 66. **B**
- 67. **B**
- 68. **A**
- 69. **B**
- 70. **C**
- 71. **C**
- 72. **A**
- 73. **A**
- 74. **B**
- 75. **C**
- 76. **A**
- 77. **C**
- 78. **A**
- 79. **A**
<table>
<thead>
<tr>
<th>QUESTION NUMBER</th>
<th>QUESTION TEXT</th>
<th>CHOICES</th>
<th>CORRECT ANSWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.</td>
<td>Matte is the mixture of.</td>
<td>a) Copper sulphide and iron sulphide b) Iron sulphide and zinc sulphide c) Iron sulphide and aluminum sulphide d) Copper sulphide and zinc sulphide</td>
<td>A</td>
</tr>
<tr>
<td>68.</td>
<td>The color of copper is.</td>
<td>a) Gray b) Radish brown c) Green d) Blue</td>
<td>B</td>
</tr>
<tr>
<td>69.</td>
<td>Nilathotha i.e. CuSO₄ has how many water molecules?</td>
<td>a) 4 b) 3 c) 5 d) 6</td>
<td>C</td>
</tr>
<tr>
<td>70.</td>
<td>Lunar caustic is the commercial name of</td>
<td>a) AgNO₃ b) CuSO₄ c) NaOH d) NH₄Cl</td>
<td>A</td>
</tr>
<tr>
<td>71.</td>
<td>The color of KMnO₄ is.</td>
<td>a) Blue b) Yellow c) Dark purple d) Green</td>
<td>C</td>
</tr>
<tr>
<td>72.</td>
<td>Corrosion of a metal produces.</td>
<td>a) Chloride b) Sulphate c) Oxide d) Nitrite</td>
<td>C</td>
</tr>
<tr>
<td>75.</td>
<td>Hypo is the commercial name of.</td>
<td>a) Sodium hydroxide b) Sodium thiosulphate c) Sodium Sulphate d) Sodium bicarbonate</td>
<td>B</td>
</tr>
<tr>
<td>76.</td>
<td>The melting point and boiling point of transition elements as compared to s and p block elements are.</td>
<td>a) Higher b) Lower c) Intermediate between s and p block d) None of these</td>
<td>A</td>
</tr>
<tr>
<td>77.</td>
<td>The transition elements are usually.</td>
<td>a) Colorless b) Colored c) Opaque d) Gray colored</td>
<td>B</td>
</tr>
<tr>
<td>78.</td>
<td>Elements in which d and f orbital are in the process of completion are called.</td>
<td>a) Normal elements b) Transition elements c) Zero group elements d) p block elements</td>
<td>B</td>
</tr>
<tr>
<td>79.</td>
<td>Variable valency is shown by.</td>
<td>a) Normal elements b) Transition elements c) Typical elements d) All of the elements</td>
<td>B</td>
</tr>
<tr>
<td>839.</td>
<td>Manganese differs from most other transition elements because it reacts with</td>
<td>a) Oxygen b) Water c) Sulphur d) Iodine</td>
<td>B</td>
</tr>
<tr>
<td>840.</td>
<td>Which of the following elements can be included in the category of transition elements</td>
<td>a) Cu b) Al c) Ar d) At</td>
<td>A</td>
</tr>
<tr>
<td>841.</td>
<td>Potassium ferrocyanide is a</td>
<td>a) normal salt b) mixed salt c) double salt d) complex salt</td>
<td>D</td>
</tr>
<tr>
<td>842.</td>
<td>Mn₃O₄ is</td>
<td>a) an acidic oxide b) a basic oxide c) a neutral oxide d) an amphoteric oxide</td>
<td>D</td>
</tr>
<tr>
<td>845.</td>
<td>Which of the following combinations is included in the Iron traid of elements</td>
<td>a) Pd and Pt b) Mn and Hg c) Co and Ni d) V and Ti</td>
<td>C</td>
</tr>
</tbody>
</table>
d- BLOCK ELEMENTS (Transition Elements)

846. The highest common oxidation state of chromium is
   a) +4  
   b) +5  
   c) +6  
   d) +7  

847. A substance which is not paramagnetic is
   a) Cr (ClO₄)₃  
   b) K₅MnO₄  
   c) TiCl₃  
   d) VOBr₂  

848. Disproportionation is shown by
   a) Cr (OH)₂  
   b) MnO₄⁻  
   c) (OH)₃  
   d) Mn³⁻  

851. Reduction of MnO₄⁻ in strongly basic solution produces
   a) Mn²⁺  
   b) MnO₂⁻  
   c) MnO₂  
   d) Mn₂O₇  

853. The ferricyanide ion is
   a) Fe (CN)₆⁶⁻  
   b) Fe (CN)₆⁴⁻  
   c) Fe (CN)₃⁻  
   d) Fe (CN)₆³⁻  

854. The yellow colour of a solution prepared by adding 0.1 mole of Fe(NO₃)₃ to one litter of water is largely due to
   a) FeCl²⁺  
   b) Fe(OH)⁺  
   c) Fe(OH)₄⁻  
   d) Fe(H₂O)₆  

855. Iron may be rendered passive by treatment with a concentrated solution of
   a) H₂C₂O₄  
   b) HCl  
   c) HNO₃  
   d) KSCN  

859. Ferric oxide is
   a) a basic anhydride  
   b) an acid anhydride  
   c) an amphoteric anhydride  
   d) green  

861. The most strongly ferromagnetic elements is
   a) Fe  
   b) Co  
   c) Ni  
   d) Os
### INTRODUCTION TO ORGANIC CHEMISTRY

01. Urea was obtained by heating______.  
   a) Ammonium cyanate  
   b) Carbon  
   c) Oxygen  
   d) Copper  

02. Fredrick Wohler prepared urea in.  
   a) 1807  
   b) 1828  
   c) 1927  
   d) 1807B

04. The branch of chemistry which deals with the study of compounds of carbon is called______.  
   a) Organic chemistry  
   b) Inorganic chemistry  
   c) Electrical force  
   d) None of these

05. The branch of chemistry which does not deal with the compound of carbon is called.  
   a) Organic chemistry  
   b) Inorganic chemistry  
   c) Complex  
   d) Acetates

06. ______ is an essential part of organic compounds.  
   a) Nitrogen  
   b) Oxygen  
   c) Carbon  
   d) None of these

07. The elements which have same molecular formula but different structural formula, is called.  
   a) Isomers  
   b) Tetravalent  
   c) Molecular  
   d) Different

08. The formula of methane is______.  
   a) CH₄  
   b) CH₂  
   c) CH₃  
   d) CH₅

09. The general formula for ane-group is______.  
   a) CₙH₂₄  
   b) CₙH₂₄₂  
   c) CₙH₂₄₂  
   d) None of these

10. The general formula of ene-group is______.  
    a) CₙH₂₈  
    b) CₙH₂₈₂  
    c) CₙH₂₈₂  
    d) None of these

11. The general formula of yne-group is______.  
    a) CₙH₂₆  
    b) CₙH₂₆₂  
    c) CₙH₂₆₂  
    d) None of these

12. The formula of methyl alcohol is______.  
    a) CH₃OH  
    b) CH₃(OH)₃  
    c) CH₅  
    d) None of these

13. The atoms in the organic compounds are joined by______ bond.  
    a) Ionic  
    b) Covalent  
    c) Simple  
    d) None of these

14. The atoms in the inorganic compounds are joined by______ bond.  
    a) Ionic  
    b) Covalent  
    c) Simple  
    d) None of these

15. Organic compounds are generally______ in water.  
    a) Ionic  
    b) Insoluble  
    c) Soluble  
    d) None of these

16. Inorganic compounds are generally______ in water.  
    a) Soluble  
    b) Insoluble  
    c) Isomerism  
    d) None of these

17. Organic compounds deal with the process of______.  
    a) Coal  
    b) Petroleum  
    c) Isomerism  
    d) None of these
18. Organic compounds are the _______ gradient of food.
   a) Important   b) Hard
   c) Soft        d) None of these
   A

19. Methane and petrol are used as_______.
   a) Fuel    b) Plants
   c) Water   d) None of these
   A

20. “Urea” is a _______ compound.
   a) Organic  b) Inorganic
   c) Simple   b) Metal
   A

21. We can prepare______ compounds in laboratory.
   a) Simple   b) Complex
   c) Organic  d) None of these
   C

22. Organic compounds are obtained from _______ and plants.
   a) Animals  b) Carbon
   c) Fats     d) None of these
   A

23. We can get “urea” from_______.
   a) Cow  b) Animals
   c) Coal d) Oxygen
   B

24. The main constituent of coal is ________.
   a) Carbon  b) Oxygen
   c) Nitrogen d) Hydrogen
   A

25. Anthracite contains______ carbon.
   a) 40-45%   b) 92-98%
   c) 50-55%   d) 95-100%
   B

   a) 85%      b) 58%
   c) 95%      d) 40%
   A

27. Sub-bituminous coal contains_______ carbon.
   a) 95%      b) 80%
   c) 90%      d) 100%
   B

   a) 40%      b) 50%
   c) 50-60%   d) 60-70%
   C

29. Carbon is a ______ atom.
   a) Tetravalent b) Black
   c) Simple     d) 99%
   A

30. The main component of coal is________.
   a) Carbon  b) Oxygen
   c) Nitrogen d) Lignite
   A

31. Coal gas is a mixture of _______H₂, _______CH₄ and _______CO.
    a) 50%, 8%, 100%   b) 50%, 35%, 8%
    c) 60%, 40%, 10%    d) None of these
    B

32. Crude coal gas consists of benzole, coal gas, _______ and sulphur compounds.
    a) Cyanides  b) Oxides
    c) Methane   d) Graphite
    A

33. Natural gas is produced by the________ of organic compounds.
    a) Fertilizers  b) Decomposition
    c) Reforming  d) Distillation
    B
34. When the large number of molecules of the same substance is combined to form large sized product, this process is called:
   a) Polymerization  b) Monomer  c) Polymer  d) Breaking  
   **A**

35. When the large number of molecules of the same substance is combined to form large sized product, this process is called:
   a) Polymerization  b) Monomer  c) Polymer  d) Breaking  
   **A**

36. The formula for “dimethyl ether” is _______.
   a) C₂H₂  b) CH₃O–CH₃  c) C₂H₆  d) CH₄  
   **B**

37. There are _______ main types of organic compounds.
   a) Two  b) Three  c) Five  d) Six  
   **A**

38. Isomers of “C₂H₆O” are _______ and dimethyl ether.
   a) Propanal  b) Ethyl alcohol  c) Butane  d) None of these  
   **B**

39. The structural formula of n-butane is.
   a) CH₃–CH₂–CH₂–CH₃  b) CH₃–CH₂–CH₂–CH₄  c) CH₂–CH₂–CH₂–CH₂–CH₃  d) None of these  
   **A**

40. The name of CH₃–CH–CH₃ is _______.
   a) Dimethy ether  b) Ethyl alcohol  c) 2-chloro propane  d) 3-ethyl pentane  
   **C**

41. The series of compounds whose each number shows the same set of properties, is called _______ series.
   a) Homologous  b) Same  c) Chain  d) None of these  
   **A**

42. In alkanes group, the next higher number differs from first by only _______.
   a) CH₄  b) CH₃  c) CH₂  d) C₂H₂  
   **C**

43. The formula of decane is _______.
   a) C₁₀H₂₂  b) C₈H₁₆  c) C₈H₂₀  d) C₆H₁₄  
   **A**

44. There are _______ main types of chain.
   a) Two  b) Five  c) Three  d) Four  
   **C**

45. The single branched carbon chain is called _______ chain.
   a) Iso  b) Neo  c) Simple  d) Primary  
   **A**

46. Alkyl is a radical which is form due to the _______ of one (H) from an alkane.
   a) Removal  b) Difference  c) Identical  d) None of these  
   **A**

47. The process in which we name the compounds, is called _______ system.
   a) S.I  b) R.U  c) IUPAC  d) None of these  
   **A**

48. The formula of nonene is _______.
   a) C₉H₁₈  b) C₆H₁₃  c) C₆H₁₆  d) C₈H₁₃  
   **A**
49. The formula of nonyne is_________.
   a) $C_7H_{18}$  
   b) $C_9H_{16}$  
   c) $C_8H_{16}$  
   d) $C_{10}H_{18}$  
   B  
50. In IUPAC system, the carboxylic acids are called_________ acid.
   a) Methyl  
   b) Benzenoic  
   c) Alkanoic  
   d) None of these  
   C  
51. Tetra ethyl lead is most commonly used_________ chemical.
   a) Tri-ethyl  
   b) Pitch  
   c) Anti-knock  
   d) None of these  
   C  
52. The basic units from which polymers are formed are called_________.
   a) Monomers  
   b) Diamers  
   c) Armatic  
   d) Cyclic  
   A  
53. Toluene is an________ compound.
   a) Monomers  
   b) Aromatic  
   c) Analogous  
   d) None of these  
   B  
54. “$C_7H_{22}$” is the formula of_________.
   a) Hyptyne  
   b) Octyne  
   c) Nonane  
   d) Hyptane  
   A  
55. The alkyl group are generally represented by.
   a) X-  
   b) R-  
   c) -Z  
   d) -K  
   B  
56. The molecules containing at least one triple bond are called.
   a) Paraffins  
   b) Acetylenes  
   c) Alcohols  
   d) None of these  
   B  
57. “-OH” is called________ group.
   a) Hydroxyl  
   b) Halide  
   c) Oxygen  
   d) Hydrogen  
   A  
58. A mixture of hydrocarbons containing 11 to 12 carbons atoms and boiling point in the range of 160 to 250$^\circ$C is called.
   a) Gasoline  
   b) Kerosene  
   c) Diesel oil  
   d) None of the above  
   B  
59. The process in which orbital of different energies and shape mix with each to give equivalent hybrid orbital is called.
   a) Polymerization  
   b) Hybridization  
   c) Isomerization  
   d) None of the above  
   B  
60. Compounds having same molecular formula but different carbon skeleton are called.
   a) Position isomers  
   b) Chain isomers  
   c) Functional group isomers  
   d) None of the above  
   B
10. The process of distillation is employed for the purification of liquid from.
   a) Volatile impurities  
   b) Non volatile impurities  
   c) Insoluble impurities  
   d) All kinds of impurities  
   B

11. The union of two or more molecules of a substance to form a large single molecule is called.
   a) Fusion  
   b) Synthesis  
   c) Polymerization  
   d) None of the above  
   C

12. Anti knocking character of gasoline is improved by the addition of.
   a) Ethyl lead  
   b) Diethyl lead  
   c) Triethyl lead  
   d) Tetra ethyl lead  
   D

13. The general formula of Ketone is written as.
   a) ROR  
   b) RCOR  
   c) RCOOR  
   d) RCHOHR  
   B

14. The alternative position on the benzene ring are called.
   a) Ortho positions  
   b) Meta positions  
   c) Para positions  
   d) None of the above  
   B

15. A carbon atom in organic molecules which is directly linked to three carbon atoms are known as.
   a) Primary carbon atom  
   b) Secondary carbon atom  
   c) Tertiary carbon atom  
   d) None of the above  
   C

16. Majority of organic compounds contain.
   a) Hydrogen and oxygen  
   b) Nitrogen  
   c) Sulphur  
   d) Halogens  
   A

17. The organic compounds which contain at least one carboxyl group are called.
   a) Methanoic acid  
   b) Carboxylic acids  
   c) Ethanoic acids  
   d) Pentanoic acids  
   B

18. The carboxylic acid which contain two and three carboxyl groups are called.
   a) Dis carboxylic and tricarboxylic acids  
   b) Formic acid  
   c) Hexanoic acid  
   d) Propanoic acid  
   A

19. The first organic compound prepared in the laboratory was.
   a) Sugar  
   b) Alcohol  
   c) Urea  
   d) None of the above  
   C

20. It is found that all the organic compounds contain.
   a) Carbon  
   b) Hydrogen  
   c) Nitrogen  
   d) Oxygen  
   A

21. Which of the following is not an inorganic compound?
   a) CO₂  
   b) CaC₂  
   c) Na₂CO₃  
   d) CCl₄  
   D

22. Which compound play very important role in the daily life of animals and plants?
   a) Organic compounds  
   b) Inorganic compounds  
   c) Both organic and inorganic compounds  
   d) None of the above  
   A

23. The major compound of natural gas is.
   a) Butane  
   b) Methane  
   c) Pentane  
   d) Heptanes  
   B

24. Petroleum contains alkenes up to.
   a) C₃₀  
   b) C₄₀  
   c) C₅₀  
   d) C₆₀  
   B

25. The fraction of petroleum obtained at the temperature range of 40-180ºC is called.
   a) Kerosene oil  
   b) Diesel  
   c) Petroleum gas  
   d) Gasoline  
   D
37. The fraction of petroleum obtained at the temperature range of 220-350°C is called.
   a) Diesel oil  
   b) Kerosene oil  
   c) Lubricating oil  
   d) None of the above

   Answer: A

38. Cracking of alkenes involve the breaking of.
   a) C-C bonds  
   b) C-H bonds  
   c) Both C-C bonds C-H bonds  
   d) None of the above

   Answer: C

39. Homologues differ from each other by an integral number of.
   a) CH₂ group  
   b) CH₃ group  
   c) CH group  
   d) None of these

   Answer: A

40. The isomerism in which the functional group changes in the same molecular formula to form different compounds is called.
   a) Metamerism  
   b) Functional isomerism  
   c) Position isomerism  
   d) Chain isomerism

   Answer: B

41. The alternative positions on the benzene ring are called.
   a) Ortho positions  
   b) Meta positions  
   c) Para positions  
   d) None of the above

   Answer: B

42. The opposite positions on the benzene ring are called.
   a) Meta positions  
   b) Para positions  
   c) Ortho positions  
   d) None of the above

   Answer: B

43. The consecutive positions on the benzene ring are called.
   a) Ortho positions  
   b) Para positions  
   c) Meta positions  
   d) None of the above

   Answer: A

44. To name an alcohol, ‘e’ from the name of alkane is replaced by.
   a) al  
   b) ol  
   c) Both al and ol  
   d) None of the above

   Answer: B

45. Benzene is a member of.
   a) Alkane series  
   b) Saturated hydro carbons  
   c) Aromatic hydro carbons  
   d) Alkyne series

   Answer: C

46. The following organic compounds are all carbohydrate except.
   a) Glucose  
   b) Fructose  
   c) Starch  
   d) Glycerol

   Answer: D

50. Quality of fuel is judged from its octane number. The best fuels are.
   a) Straight chain hydrocarbons  
   b) Branched chain hydrocarbons  
   c) Cyclic compounds  
   d) Compounds containing benzene ring

   Answer: B

51. Hydrocarbons are studied in.
   a) Organic chemistry  
   b) In organic chemistry  
   c) Biochemistry  
   d) Industrial chemistry

   Answer: A

52. Catenation is a process in which carbon shows the properties of making.
   a) Multiple bond  
   b) Hybridization  
   c) Long chains or rings of carbon atoms  
   d) Showing isomerism

   Answer: C

53. The first organic compound obtained from inorganic substance is.
   a) Benzene  
   b) Urea  
   c) Dye  
   d) Fiber

   Answer: B
55. Organic compounds are those which.  
a) Must contain carbon as one of its constituents  
b) Must contain carbon and hydrogen only  
c) Artificially produced in the laboratory  
d) Give a particular smell  
A

56. We use tetraethyl lead in gasoline to.  
a) Reduce the consumption of fuel  
b) Reduce the price of fuel  
c) Reduce the octane number of fuel  
d) Reduce the knocking of the engine  
D

57. Organic compound are produced in nature in.  
a) Plants only  
b) Animals only  
c) Atmosphere  
d) Both (a)and (b)  
D

58. What type of fuel is coal?  
a) Solid fuel  
b) Liquid fuel  
c) Gaseous fuel  
d) Semi liquid fuel  
A

59. The main components coal is.  
a) Oxygen  
b) Sulphur  
c) Hydrogen  
d) Carbon  
D

60. When coal is heated (500-1000°C) in the absence of air the process is called.  
a) Carbonization  
b) Distillation  
c) Cracking  
d) Reforming  
A

61. Petroleum in the unrefined form is called.  
a) Rock oil  
b) Kerosene oil  
c) Lubricating oil  
d) Gasoline  
A

62. The highest percentage of natural gas is that of.  
a) Ethane  
b) Propane  
c) Methane  
d) Butane  
C

63. The best definition of a good fuel is that.  
a) It is difficult to ignite  
b) It produces large amount of smoke  
c) It give out much heat  
d) It leaves much ash  
C

64. Which of the following main compounds of coal is the richest in carbon content?  
a) Anthracite  
b) Bituminous coal  
c) Sub bituminous coal  
d) Lignite  
A

65. Compounds having the same molecular formula but different structures are called.  
a) Monomers  
b) Polymers  
c) Isomers  
d) Metamers  
C

66. Which of the following is called marsh gas.  
a) Methane  
b) Ethane  
c) Propane  
d) Butane  
A

67. Oxy acetylene flame is used for the cutting and welding of the metals it reaches a temperature of.  
a) 1000°C  
b) 2000°C  
c) 3000°C  
d) 4000°C  
C

68. Compounds, \( \text{CH}_3-\text{O-CH}_3 \) and \( \text{CH}_3-\text{CH}_2-\text{OH} \), have the same molecular formula \( (\text{C}_4\text{H}_2\text{O}) \) but different structure, are called _______.  
a) Monomers  
b) Polymers  
c) Isomers  
d) Metamers  
C

69. A thick viscous liquid obtained from the earth crust often of brown color or greenish black color is called.  
a) Lignite  
b) Coal tar  
c) Petroleum  
d) Petrol  
C
74. Cracking is a process in which.
   a) Larger molecular are broken down in to smaller molecules
   b) Smaller molecules are joined in to larger molecules
   c) Open chain carbon molecules are changed to cyclic molecules
   d) Close chain molecules are change in to open chain

A

75. $\text{3CH}=\text{CH} \xrightarrow{\text{Cu} \text{tube} \ 600^\circ \text{C}} \text{C}_6\text{H}_6$. The above reaction is.
   a) Polymerization
   b) Cracking
   c) Addition
   d) Substitution

A

79. In Pakistan there are vast reservoirs of natural gas at.
   a) Peshawar
   b) Sui
   c) Lahore
   d) Kohat

B

80. The percentage of methane in Sui gas is.
   a) 50 %
   b) 60 %
   c) 94.6 %
   d) 90 %

C
CHEMISTRY OF HYDROCARBONS

01. The compounds which consist of hydrogen and carbon are called_________.
   a) Hydrocarbons  
   b) Carbon  
   c) Organic  
   d) Inorganic  
   A

02. n-butane is the example of ________.
   a) Propane  
   b) Hydrocarbon  
   c) Alkenes  
   d) Butyne  
   B

03. The saturated hydrocarbons are the compounds of hydrogen and carbon which have_________.
   a) All double bonds  
   b) All triple bonds  
   c) All single bonds  
   d) None of these  
   C

04. Alkenes and cycloalkenes are the example of ________.
   a) Unsaturated hydrocarbons  
   b) Aromatic hydrocarbons  
   c) Simple hydrocarbons  
   d) Saturated hydrocarbons  
   A

05. Alkanes are also called__________.
   a) Paraffins  
   b) Hydrocarbons  
   c) Organic compounds  
   d) None of these  
   A

06. Alkenes have at least one Carbon–Carbon ________ bond.
   a) Single  
   b) Double  
   c) Triple  
   d) None of these  
   B

07. Alkynes have at least one carbon–carbon_________ bonds.
   a) Triplet  
   b) Double  
   c) Single  
   d) None of these  
   A

08. Methane is also called__________ gas.
   a) Hydrogen  
   b) Nitrogen  
   c) Marsh  
   d) Simple  
   C

09. The natural gas contains__________ methane.
   a) 85-90%  
   b) 80-85%  
   c) 75-80%  
   d) 70-75%  
   A

10. The laboratory preparation of methane is given as__________.
    a)  
    b)  
    c)  
    d) None of these  
    B

11. The boiling point of methane is__________.
    a) -162°C  
    b) -192°C  
    c) 202°C  
    d) 702°C  
    A

12. Methane is__________ in water.
    a) Reactive  
    b) Soluble  
    c) Insoluble  
    d) None of these  
    C

13. The formula for dichloro methane is__________.
    a) CH₂Cl₂  
    b) CH₃Cl₂  
    c) CH₂Cl  
    d) None of these  
    A

14. The formula for tetrachloro methane is__________.
    a) CH₂Cl₂  
    b) CH₃Cl₂  
    c) CCl₄  
    d) CHCl₃  
    C
15. \( \text{CH}_3\text{Cl}_2 + \text{Cl}_2 \rightarrow \underline{?} \).
   a) \( \text{CH}_2\text{Cl}_2 + \text{HCl} \)
   b) \( \text{CHCl}_2 + \text{HCl} \)
   C) \( \text{C} + 4\text{HCl} \)
   d) \( \text{CCl}_4 + \text{HCl} \)

16. \( \text{CH}_4 + 2\text{Cl}_2 \rightarrow \underline{?} \).
   a) \( \text{CCl}_4 + \text{HCl} \)
   b) \( \text{C} + 9\text{HCl} \)
   c) \( \text{C} + 4\text{HCl} \)
   d) \( \text{CHCl}_3 + \text{HCl} \)

17. The reducing order of reactivity of halogens is ________.
   a) \( \text{Cl}_2 \gg \text{Br}_2 > \text{I}_2 \)
   b) \( \text{Cl}_2 < \text{Br}_2 > \text{I}_2 \)
   c) \( \text{Br}_2 > \text{Cl}_2 > \text{I}_2 \)
   d) \( \text{I}_2 > \text{Br}_2 > \text{Cl}_2 \)

18. The process of racking represented as ________.
   a) \( \text{CH}_4 \rightarrow \text{CH}_4 + 2\text{H}_2 \)
   b) \( \text{CH}_4 + \text{H}_2 \text{O} \rightarrow \text{CO} + 3\text{H}_2 \)
   c) \( \text{CH}_4 + \text{O} \rightarrow \text{CH}_3\text{OH} \)
   d) None of these

19. The formula for the formaldehyde is __________.
   a) \( \text{CH}_3\text{OH} \)
   b) \( \text{HCHO} \)
   C) \( \text{CH}_3\text{Cl} \)
   d) None of these

20. The commercial preparation of “\text{H}_2” is represented by the following equation.
   a) \( \text{CH}_4 + \text{H}_2 \text{O} \rightarrow \text{CO} + 3\text{H}_2 \)
   b) \( \text{CH}_4 + \text{O} \rightarrow \text{CH}_3\text{OH} \)
   c) \( \text{CCO} + \text{O} \rightarrow \text{HCOOH} \)
   d) None of these

21. Methane is gas used as ________.
   a) Fuel
   b) Steam
   c) Fertilizer
   d) None of these

22. Natural gas contains __________ ethane
   a) 18-20%
   b) 8-10%
   c) 28-30%
   d) 38-40%

23. The formula for sod-propionate is ________.
   a) \( \text{C}_2\text{H}_5\text{COONa} \)
   b) \( \text{CH}_2=\text{CH} \)
   c) \( \text{CH}_3\text{CHO} \)
   d) None of these

24. \( \text{CH}_2=\text{CH}_2 + \text{H}_2 \rightarrow \underline{?} \)
   a) \( \text{C}_2\text{H}_4 + \text{H}_2 \text{O} \)
   b) \( \text{CH}_3 – \text{CH}_3 \)
   c) \( \text{C}_2\text{H}_6 \)
   d) None of these

25. The boiling point of ethane is ________
   a) -89°C
   b) -98°C
   c) -48°C
   d) -84°C

26. When ethane reacts with oxygen then ________ gas is formed.
   a) \( \text{O}_2 \)
   b) \( \text{CO} \)
   c) \( \text{CO}_2 \)
   d) \( \text{CH}_4 \)

27. Natural gas contains __________ ethene
   a) 1-1.5%
   b) 4 – 5.5%
   c) 9 – 21%
   d) 14 – 16%
28. The boiling point of ethene is ____________.
   a) 96°C       b) - 105°C  
   c) 2-5°C      d) 407°C     B
29. \[ \text{C}_2\text{H}_4 + 3\text{O}_2 \xrightarrow{\text{M}} \] ____________
   a) 2\text{CO}_2 + 2\text{H}_2\text{O} + \text{heat}  
   b) 2\text{CO}_2 + 2\text{H}_2\text{O} + \text{heat}  
   c) \text{CO}_2 + 4\text{H}_2\text{O} + \text{heat}      d) None of these  A
30. The formula for acetylene is ____________
   a) \text{C}_2\text{H}_4   b) \text{C}_2\text{H}_2  
   c) \text{C}_2\text{H}_6   d) None of these  B
31. Acetylene was discovered in _____________
   a) 1999       b) 2000     
   c) 1837       d) 1899     D
32. When “\text{C}_2\text{H}_4” reacts with “\text{O}_2” then ____________ is produced.
   a) \text{“CO}_2” and \text{“H}_2\text{O}”  
   b) \text{“CO” and \text{“H}_2\text{O}”}  
   c) \text{“H}_2” and \text{“CH}_4”      d) \text{“Cl}_2” and \text{“H}_2”  A
33. The benzene contains ____________ double bonds.
   a) Four       b) Two      
   c) Three      d) Five     C
34. \[ 2\text{C}_6\text{H}_6 + 15\text{O}_2 \rightarrow \] ____________
   a) 12\text{CO}_2 + 6\text{H}_2\text{O}  
   b) \text{CO}_2 + 8\text{H}_2\text{O}  
   c) 9\text{CO}_2 + 8\text{H}_2\text{O}     d) None of these  A
35. Soda lime is a mixture of \text{Ca(OH)}_2 and conc. ____________
   a) \text{NaOH solution}  
   b) \text{CaO solution}  
   c) \text{Na}_2\text{CO}_3 solution d) None of these  A
36. H – C – H bonds angles in methane are ____________
   a) 210. 3°       b) 109.5°  
   c) 104.5°       d) 215.4°     B
37. Ethyle halide is reduced to ethane by ____________
   a) Nascent hydrogen  b) Nascent oxygen  
   c) \text{π} - bonds  d) \text{γ} -bonds     A
38. All the bond angles of ethane molecules are ____________
   a) 211°       b) 109.5°  
   c) 215.5°     d) 410°       B
39. The total number of sigma bond in ethane is ____________
   a) Seven  
   c) Three  b) Five     d) Two       A
40. Halogens are added quantitatively to ethylene to give ____________
   a) Two  b) Dihalide  
   c) Trihalide d) Dehydration   B
41. The order of reactivity of halogen acid ethylene is ____________
   a) HI > HBr > HCl       b) HI < HBr < HCl 
   c) HCl < HNO_3 < H_2SO_4  d) None of these  A
42. Addition of water to a molecule is called ____________
   a) Hydration   b) Catalyst  
   c) Enzyme   d) None of these  A
43. In ethane, all the bond angles are of ____________.
   a) 217°  b) 120°  
   c) 210°  d) 204°     B
44. All the atoms of ethane are present in _______.
a) One plane only  
b) In two planes  
c) In three planes  
d) None of these

45. Halogens are added to acetylene to give dihalide and _______.
a) Monohalide  
b) Tetrahalide  
c) Methane  
d) None of these

46. Ozone is a _______ of oxygen.
a) Reaction  
b) Form  
c) Palm test  
d) Flame test

47. The carbon atoms in ethane molecules are _______.
a) SP\(^2\) hybridized  
b) SP\(^3\) hybridized  
c) SP\(^4\) hybridized  
d) None of these

48. Ozone is represented as _______.
a) O\(_{12}\)  
b) O\(_{14}\)  
c) O\(_{15}\)  
d) O\(_3\)

49. Benzene was discovered by _______ in 1825.
a) Faraday  
b) Wortz.  
c) Maxwell  
d) None of these

50. Which of these is not an unsaturated molecule?
a) C\(_4\)H\(_6\)  
b) C\(_6\)H\(_6\)  
c) C\(_8\)C\(_18\)  
d) C\(_3\)H\(_6\)

51. C\(_3\)H\(_8\) + Cl\(_2\) \(\xrightarrow{\text{light}}\) C\(_3\)H\(_6\)Cl\(_2\) + 2HCl is an example of:
a) Addition reaction  
b) Oxidation reaction  
c) Substitution reaction  
d) Elimination reaction

52. Reaction with a double bond gives which type of reaction?
a) Addition reaction  
b) Oxidation reaction  
c) Substitution reaction  
d) Substitution reaction

53. The IUPAC name of the following compound is _______.

\[
\begin{align*}
CH_3 \\
| \\
CH_3 - CH - CH - CH_2 - CH_3CH_3 \\
| \\
CH_2 - CH_3
\end{align*}
\]
a) 3- methyl-3-ethylheptane  
b) 3- methyl-2-methylhexane  
c) 3- methyl-3-ethylheptane  
d) 4- methyl-3-ethylheptane

54. A photochemical reaction which is catalyzed by the presence of
a) Ni  
b) Pt  
c) Sunlight  
d) FeCl\(_3\)

55. Which class of compounds is presented by the type formula ROR?
a) Aldehyde  
b) Ether  
c) Ester  
d) Ketone

56. The negative part of the addendum adds on to the carbon atoms joined to the least number of hydrogen atoms. The statement is called
a) Markownikoff’s rule  
b) Peroxide effect  
c) Elimination reaction  
d) Baeyer’s theory

57. Which of the following hydrocarbon have the same general formula:
a) Alkane & Alkene  
b) Alkene & Alkynes  
c) Alkene & Dienes  
d) Alkene & Cycloalkane
13. Which of the following statement is correct about hydrocarbons:
   a) Alkene having less than two carbon atom is not possible.
   b) Alkene is also called as parafins
   c) General formula of alkene is \( C_nH_{2n} \)
   d) If unsaturated hydrocarbons contain triple bond between carbon-carbon atom, then it is called alkene
   A

16. Hydrocarbons with double or triple covalent bonds between any two carbon atoms are called:
   a) Saturated hydrocarbons
   b) Unsaturated hydrocarbons
   c) Aromatic compounds
   d) Alkanes
   B

17. The IUPAC name for acetylene is:
   a) Ethane
   b) Ethyne
   c) Propyne
   d) 2-butyne
   B

18. General formula of saturated hydrocarbon is:
   a) \( C_nH_{2n} \)
   b) \( C_nH_{2n+1}OH \)
   c) \( C_nH_{2n+2} \)
   d) \( C_nH_{2n-2} \)
   C

21. At ordinary temperature, halogens added to the alkenes form:
   a) Vicinal dihalides
   b) Alkyl halides
   c) Alkanes
   d) Vinyl halide
   A

22. Carbon-carbon bond length in alkyne is 1.20 Å and carbon-hydrogen bond length is 1.08 Å, hybridization in alkyne is:
   a) SP
   b) SP²
   c) SP³
   d) d² SP³
   C

23. Hydrogen atom of acetylene are:
   a) Acidic
   b) Basic
   c) Neutral
   d) Amphoteric
   A

25. Ethyl alcohol is heated with conc. \( H_2SO_4 \), the product formed is:
   a) \( H_3C – C – OC_2H_5 \)
   b) \( C_2H_6 \)
   c) \( C_2H_4 \)
   d) \( C_2H_2 \)
   C

26. Which has least carbon-carbon bond length:
   a) Ethane
   b) Ethene
   c) Ethyne
   d) Benzene
   C

29. What happens when propane is treated wit HBr in the presence of peroxide:
   a) n-propyl bromide is formed
   b) 1,2 dibromopropane is formed
   c) Propylene chloride is formed
   d) None of these
   A

30. Markownikoff’s rule is useful in predicting the product of a reaction between an alkene and:
   a) \( H_2 \)
   b) \( Br_2 \)
   c) HBr
   d) \( O_3 \)
   C

31. Which statement about butene is not correct?
   a) it decolourises aqueous bromine
   b) it is generally unreactive
   c) it is a hydrocarbon
   d) it is a monomer of polyethene
   B

32. Which of the following gases gives a red precipitate with an ammonial solution of cuprous chloride:
   a) acetylene
   b) ethylene
   c) ethane
   d) propylene
   A

33. The hydrocarbon \( C_2H_6 \) must have:
   a) all single bonds
   b) one double bond
   c) one triple bond
   d) two double bonds
   B
34. Polymerization of acetylene results in the formation of:
   a) benzene  
   b) ethane  
   c) ethylene  
   d) toluene  
   A

35. Name the hydrocarbon that is a liquid at S.T.P.:
   a) ethane  
   b) propane  
   c) n-butane  
   d) n-Pentane  
   D

36. Ammonical silver nitrate solution reacts with acetylene to form:
   a) Silver acetate  
   b) Silver acetylide  
   c) Silver formate  
   d) A silver mirror  
   B

37. Marsh gas contains a large proportion of:
   a) acetylene  
   b) ethane  
   c) ethylene  
   d) methane  
   D

38. Ethylene reacts with conc. H₂SO₄ to give:
   a) acetaldehyde  
   b) acetylene  
   c) ethyl hydrogen sulphate  
   d) formaldehyde  
   C

39. Which of the following gases is used for welding?
   a) acetylene  
   b) ethane  
   c) ethylene  
   d) methane  
   A

40. Give the antiknock gent used in gasoline:
   a) diethyldimethyl lead  
   b) ethyltrimethyl lead  
   c) tetraethyl lead  
   d) triethylmethyl lead  
   C

41. Ethylene reacts with alkaline KMnO₄ to form:
   a) acetaldehyde  
   b) ethylene glycol  
   c) ethylene oxide  
   d) formaldehyde  
   B

42. \( \text{CH}_3 – \text{CH} = \text{CH}_2 + \text{HBr} \rightarrow \) ________________
   a) \( \text{CH}_3 – \text{CH}_2 – \text{CH}_2 – \text{Br} \)  
   b) \( \text{CH}_2 – \text{CH} – \text{CH}_3 \)
   c) \( \text{CH}_2 – \text{CH} = \text{CH}_2 \)
   d) \( \text{CH}_3 – \text{H}_2\text{C} = \text{CH}_2 \)
   B

43. The reaction, \( 2\text{RX} + 2\text{Na} \rightarrow \text{R} – \text{R} + 2\text{NaX} \) is an example of:
   a) Cannizaro’s reaction  
   b) Kolbe’s reaction  
   c) Svbatier & Sanderen’s reaction  
   d) Wurtz reaction  
   D

44. Acetylene on reduction yields:
   a) alkane  
   b) alcohol  
   c) acetaldehyde  
   d) Acetone  
   A

45. Baeyer’s rest is not applicable:
   a) alkyl  
   b) alkene  
   c) both of these  
   d) none of these  
   D

46. The solution used for the purification of acetylene is:
   a) CuSO₄ solution  
   b) Baeyer’s reagent  
   c) Silver nitrate solution  
   d) none of the above  
   B

47. The molecular formula of a product formed by the reaction between propane and chlorine in light could be:
   a) \( \text{C}_3\text{H}_7\text{Cl}_2 \)  
   b) \( \text{C}_3\text{H}_5\text{Cl}_2 \)  
   c) \( \text{C}_3\text{H}_6\text{Cl} \)  
   d) \( \text{C}_3\text{H}_5\text{Cl}_4 \)  
   C
49. Which compound is reacted with water, in the presence of a catalyst and under high pressure, to make industrial ethanol:
   a) ethane
   b) ethane
   c) ethyne
   d) ethanal

50. Which type of reaction occurs between ethane and hydrogen:
   a) addition
   b) oxidation
   c) substitution
   d) reduction

51. By the action of water on methyl magnesium bromide, is obtained:
   a) CH₄
   b) C₂H₆
   c) CH₃OH
   d) C₂H₅OH

52. Compounds with maximum percentage of hydrogen is:
   a) C₂H₂
   b) C₆H₁₂
   c) C₂H₄
   d) CH₄

53. The reaction conditions leading to the best yields of C₂H₅Cl are:
   a) C₂H₆ (excess) + Cl₂ → b) C₂H₆ + Cl₂ → C₂H₅Cl
   c) C₂H₆ + Cl₂ (excess) → d) C₂H₆ + Cl₂ → C₂H₅Cl

54. By which of the following processes can acetic acid be converted into methane?
   a) Dehydrogenation
   b) Dehydration
   c) Decarboxylation
   d) Polymerization

55. When aluminium carbide is hydrolyzed, gas produced is:
   a) C₂H₂
   b) CH₄
   c) C₂H₄
   d) C₃H₈

56. Ethylene belongs to the class:
   a) alkynes
   b) Paraffins
   c) Olefins
   d) Amines

57. A gas does not give any precipitate with ammonical AgNO₃ but decolourises alkaline KMnO₄. The gas may be:
   a) C₂H₂
   b) C₂H₄
   c) C₂H₆
   d) C₃H₈

58. Which of the following displaces hydrogen on reaction with sodium?
   a) CH₄
   b) C₂H₆
   c) C₂H₄
   d) C₂H₂

59. Hydrogen atoms are most acidic in:
   a) ethane
   b) ethane
   c) ethyne
   d) benzene

60. The hybridization of carbon atoms in C – C single bond of HC = C – CH = CH₂ is:
   a) sP³ – sP³
   b) SP² – SP³
   c) SP – SP²
   d) sP³ – SP
Chapter 8

ALKYL HALIDES

01. When we replace one hydrogen atom of alkane with halogen atom then the compound formed is called _________.
   a) Alkyl halide  b) Organic compound  c) Inorganic compound  d) Carbon compound  
   Answer: a) Alkyl halide

02. The general formula for alkyl halide is ___________.
   a) \( \text{C}_n\text{H}_{2n+3} \)  b) \( \text{C}_n\text{H}_{2n+1}X \)  c) \( \text{C}_n\text{H}_{2n}X \)  d) \( \text{C}_n\text{H}_{2n+5}X \)
   Answer: b) \( \text{C}_n\text{H}_{2n+1}X \)

03. Primary Ethyl chloride is the example of ________ alkyl halide.
   a) Secondary  b) Triple  c) Primary  d) Halogen  
   Answer: c) Primary

04. 2-propyl chloride is the example of ________ alkyl halide.
   a) Primary  b) Triple  c) Halogen  d) Secondary  
   Answer: a) Primary

05. The decreasing order of reactivity of halogens acid is _________.
   a) HI > HBr > HCl  b) HI > HNO_3 > H_2SO_4  c) HI > HNO_3 < HCl  d) HI < H_2SO_4 < HNO_3  
   Answer: a) HI > HBr > HCl

06. \( \text{CH}_2 = \text{CH}_2 + \text{HBr} \rightarrow \) ___________.
   a) \( \text{CH}_3 = \text{CH}_2 – \text{Br} \)  b) \( \text{CH}_3 – \text{CH}_2 – \text{Br} \)  c) \( \text{CH}_3 – \text{CH}_2 – \text{Br} \)  d) None of these  
   Answer: b) \( \text{CH}_3 – \text{CH}_2 – \text{Br} \)

07. \( \text{CH}_3 – \text{CH}_2 – \text{OH} + \text{HCl} \xrightarrow{\text{ZnCl}_2, \text{Heat}} \) ___________.
   a) \( \text{CH}_3 – \text{CH}_2 – \text{Cl} + \text{H}_2\text{O} \)  b) \( \text{CH}_3 – \text{CH}_3 – \text{OH} + \text{HCl} \)  c) \( \text{CH}_3 – \text{Cl} + \text{H}_2\text{O} \)  d) None of these  
   Answer: a) \( \text{CH}_3 – \text{CH}_2 – \text{Cl} + \text{H}_2\text{O} \)

08. \( \text{C}_2\text{H}_5\text{OH} + \text{SOCl}_2 \xrightarrow{\text{Pyridine}} \) ___________.
   a) \( \text{CH}_3 – \text{CH}_2 – \text{CH}_3 + 2\text{NaCl} + \text{SO}_2\text{O}_2 \)  b) \( \text{C}_2\text{H}_5\text{Cl} + \text{SO}_2\text{O}_2 + \text{HCl} \)  c) \( \text{C}_2\text{H}_4 + \text{SO}_2 + 2\text{HCl} \)  d) None of these  
   Answer: b) \( \text{C}_2\text{H}_5\text{Cl} + \text{SO}_2\text{O}_2 + \text{HCl} \)

09. The formula for phosphorous acid is _________.
   a) \( \text{CH}_3\text{OH} \)  b) \( \text{HNO}_3 \)  c) \( \text{H}_2\text{SO}_4 \)  d) \( \text{H}_3\text{PO}_3 \)  
   Answer: d) \( \text{H}_3\text{PO}_3 \)

10. \( \text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Diffused Sunlight}} \) ___________.
    a) \( \text{CH}_3\text{Cl} + \text{HCl} \)  b) \( \text{CH}_2\text{Cl}_2 + \text{HCl} \)  c) \( \text{CH}_2\text{Cl}_2 + \text{HCl} \)  d) None of these  
    Answer: a) \( \text{CH}_3\text{Cl} + \text{HCl} \)

11. When alkyl halides are treated with “Zn” and dil-HCl then ________ are formed.
    a) Alkenes  b) Halogens  c) Alkanes  d) None of these  
    Answer: a) Alkenes

12. When alkyl halides are reacted with alcoholic “KOH” at 100° C then ________ are formed.
    a) Alkenes  b) Alkanes  c) Halogens  d) Primary amines  
    Answer: c) Halogens

13. The general formula for primary amines is _________.
    a) \( \text{R}_2\text{NH} \)  b) \( \text{RNH}_2 \)  c) \( \text{R} – \text{N} – \text{OH} \)  d) None of above  
    Answer: a) \( \text{R}_2\text{NH} \)

14. The general formula for secondary amines is _________.
    a) \( \text{R}_2\text{NH} \)  b) \( \text{R}_2\text{N}_2 \)  c) \( \text{RNH}_2 \)  d) None of above  
    Answer: b) \( \text{R}_2\text{N}_2 \)

15. The general formula for tertiary amines is _________.
    a) \( \text{R}_3\text{N} \)  b) \( \text{R}_2\text{HX} \)  c) \( \text{RH}_2\text{NH}_3 \)  d) None of these  
    Answer: a) \( \text{R}_3\text{N} \)
16. The formula for ethyl alcohol is ____________
   a) CH₃OH  b) C₂H₅OH.
   c) CH₃Cl  d) None of these
   A

17. The formula for propionic acid is ___________
   a) C₂H₅COOH  b) CH₃COOH
   c) C₂H₅OH  d) None of these
   A

18. C₃H₅⁺ is the example of ___________
   a) Electrophile  b) Nucleophile
   c) Protons  d) None of these
   A

19. Nucleophilic substitution reaction is represented as ___________
   a) SN² – reaction  b) SN²⁻ reaction
   c) SN³⁻ reaction  d) None of these
   B

20. Tertiary alkyl halides give ___________ reaction
   a) SN₁ – reaction  b) SN₂ reaction
   c) SN₃⁻ reaction  d) None of these
   A

21. Grignard’s reagent is an __________ compound
   a) Grignard  b) Soluble
   c) Organometallic  d) None of these
   C

22. The formula for ethyl nitrile is ___________
   a) C₂H₅CN  b) C₂H₅OH
   c) CH₃COOH  d) C₈H₁₂
   A

01. The organic compounds having the general formula CₙH₂ₙ₊₁X (X = Cl, Br, I) are called:
   a) Alkyl halides  b) Alkyl oxides
   c) Alkyl hydroxide  d) Alkyl hydrates
   A

02. Alcohols react with halogen acids (HCl, HBr, HI) in the presence of ZnCl₂ as a catalyst to give:
   a) Aldehydes  b) Ketones
   c) Alkyl halides  d) Aldols
   C

03. In Wurtz reaction, alkyl halides reaction with .......... metal in ethereal solution to give symmetrical
    alkane containing the double number of carbon atoms
   a) Potassium  b) Sodium
   c) Calcium  d) Magnesium
   B

04. Grignard’s reagent is
   a) Alkyl potassium halide  b) Aryl sodium halide
   c) Alkyl sodium halide  d) Alkyl magnesium halide
   D

05. When alkyl halides react with Mg in the presence of ether as a solvent to form alkyl magnesium halide also called:
   a) Grignard’s reagent  b) Frankland’s reagent
   c) Wurtz reagent  d) Hoffman’s reagent
   A

06. The hydrolysis of an alkyl magnesium halide with water gives:
   a) An alkene  b) An alkyne
   c) An alkane  d) An alkyl halide
   C

10. An alkyl halide reacts with aqueous KOH solution to give an:
   a) Aldehyde  b) Alkane
   c) Alcohol  d) Acid
   C

11. CH₃ – CH₂Br + KOH → CH₂ = CH₂ + KBr + ............
   a) H₂O  b) H₂O⁺
   c) HBr  d) KH
   A
12. The chemical reactions, in which an atom or a group of atoms replaces another atom or a group of atoms from a molecule to form a new molecule are called:
   a) Addition reactions  
   b) substitution reactions  
   c) Subtraction reactions  
   d) electrolytic reactions

   Answer: B

14. The electrophiles are either positively charged or are deficient of .................
   a) Protons  
   b) Neutrons  
   c) Electrons  
   d) Nucleus

   Answer: C

15. Example of electrophile is:
   a) C₂H₅⁺  
   b) NH₃  
   c) CH₃COO⁻  
   d) Br⁻

   Answer: A

17. Nucleophile are either negatively charged or have lone pair of ..............
   a) Protons  
   b) Electrons  
   c) Neutrons  
   d) Nucleons

   Answer: B

18. Electrophilic-Nucleophilic reactions are reactions between electrophiles and ............
   a) Nucleophiles  
   b) Hydrophiles  
   c) Protophiles  
   d) Neutrophiles

   Answer: A

19. The replacement of a nucleophile in a molecule by another ............ is called a nucleophilic substitution reaction
   a) Protophile  
   b) Hydrophile  
   c) Electrophile  
   d) Nucleophile

   Answer: D

21. The SN-reaction whose rate of reaction depends upon the concentration of two molecules is called:
   a) SN₃ reaction  
   b) SN₁ reaction  
   c) SN₂ reaction  
   d) SN₀ reaction

   Answer: C

22. Bimolecular nucleophilic substitution reactions always complete in .........
   a) Two steps  
   b) A single step  
   c) Three steps  
   d) Four steps

   Answer: B

23. The rate of SN₂ reaction depends upon the concentration of two molecules i.e., R – X and:
   a) Protophyle  
   b) Hydrophile  
   c) Electrophile  
   d) Nucleophile

   Answer: D

24. The SN – reaction whose rate of reaction depends upon the concentration of only one molecule is called ........ nucleophilic substitution reaction.
   a) Unimolecular  
   b) Bimolecular  
   c) Trimolecular  
   d) Tetramolecular

   Answer: A

25. Unimolecular substitution reaction always completes in .............
   a) One step  
   b) Two steps  
   c) Three steps  
   d) Four steps

   Answer: B

26. Generally SN₂ type reactions are given by:
   a) Tertiary alkyl halide  
   b) Secondary alkyl halide  
   c) Primary alkyl halide  
   d) Metal halide

   Answer: B

27. Generally tertiary alkyl halides give .............
   a) SN₁ reaction  
   b) SN₃ reaction  
   c) SN₂ reaction  
   d) SN₁ reation

   Answer: D

28. The order of the case of formation of carbonium ion of alkyl halide is:
   a) Ter > Sec > Pri  
   b) Ter < Sec < Pri  
   c) Sec > Ter > Pri  
   d) Sec < Ter < Pri

   Answer: A

29. Attacking nucleophile + alkyl halide → organic compound + ...........
   a) Alkaloid ion  
   b) Halide ion  
   c) Hydronium ion  
   d) Carbonium ion

   Answer: B
30. A carbon atom carrying a positive charge and attached to three more atoms or groups is called:
   a) Hydronium ion  b) Oxanium ion  c) Carbonium ion  d) Sulphonium ion
   C

31. The elimination of hydrogen halide from adjacent carbon atoms is called
   a) Dehydrogenation  b) Hydrogenation  c) Dehydrohalogenation  d) None of the above
   C

32. Acids may be obtained by treating Grignard reagent with
   a) CO  b) CO₂  c) AlCl₃  d) (HCOO)₂ Ca
   B

33. What is the main product obtained when Grignard’s reagent is allowed to react with ammonia
   a) An aldehyde  b) A ketone  c) Hydrocarbon  d) None of the above
   C

34. When Grignard’s reagent is hydrolyzed with water they are easily converted into
   a) Alkane  b) Alkene  c) Alkyne  d) None of the above
   A

35. The rate of SN₂ reaction depends upon the
   a) concentration of alkyl halides  b) Concentration of nucleophile  c) Concentration of alkyl halides and nucleophile
   d) None of the above
   C

36. The stability of the carbonium ion formed in the first step of the SN₁ reaction decreases from
   a) R₃C⁺ > R₂CH⁺ > RCH⁺₂ > CH⁺₃
   b) RCH⁺₂ > R₂CH⁺ > R₃C⁺
   c) R₂CH⁺ > RCH⁺₂ > R₃C⁺
   d) None of the above
   A

37. Alkyl halides in which a halogen atom is bonded to that carbon atom which are directly bonded with one hydrogen atom is called
   a) Primary alkyl halides  b) Secondary alkyl halides  c) Tertiary alkyl halides  d) None of the above
   B

38. On adding formaldehyde to Grignard reagent
   a) Primary alcohol is formed  b) Secondary alcohol is formed  c) Acetone is formed  d) None of the above
   A

39. When ethane is treated with HBr
   a) Ethyl bromide is formed  b) Bromine is evolved  c) Methyl bromide is formed  d) None of the above is formed
   A

40. The organic compounds having the general formula CₙH₂ₙ₊₁ X (X=Cl, Br, I) or R – X are called
   a) Monohalo alkanes or alkyl halides  b) Hydrogen halides  c) Ethyl halides  d) Aryl halides
   A

41. Ammonia reacts with Grignard’s reagent to form an
   a) Amine  b) Alkane  c) Alkene  d) Alkyl
   B

42. The formula of chloramine is
   a) CNCl  b) NH₂Cl  c) SOCl₂  d) S₂Cl₂
   B

43. SOCl₂ is the formula of
   a) Thionyl chloride  b) Chloramine  c) Cayanogen chloride  d) None of the above
   A

44. SN₁ – reaction completes in
   a) One step  b) Three steps  c) Two steps  d) Four steps
   C
19. SN₂ – reaction complete in
   a) One step  
   b) Two steps  
   c) Three steps  
   d) Five steps  

20. An alkyl halide may be a
   a) Primary alkyl halide  
   b) Secondary alkyl halide  
   c) Tertiary alkyl halide  
   d) All of the above

21. In alkyl halides halogen is
   a) Partially negative  
   b) Partially positive  
   c) Neutral  
   d) None of the above

22. Which of the following compounds does not react with bromine?
   a) Propene  
   b) Ethylamine  
   c) Chloroform  
   d) Phenol

23. When formaldehyde is added to Grignard reagent we get
   a) Aldehyde  
   b) Acetone  
   c) Primary alcohol  
   d) Secondary alcohol

24. Ethyle chloride reacts with alc, KOH to give
   a) C₂H₄  
   b) C₂H₃Cl  
   c) CH₃I  
   d) C₂H₅OH

25. Which of the following alkyl halides is used as an methylating agent?
   a) CH₂H₅I  
   b) CH₃I  
   c) C₂H₅Br  
   d) C₂H₅Cl

26. What is formed, when ethane is treated with HBr?
   a) Methyl bromide  
   b) Ethyl bromide  
   c) Bromine  
   d) Hydrogen

27. The compounds or species in search of electrons are called
   a) Electrophile  
   b) Nucleophile  
   c) Nitriles  
   d) None of the above

28. The compounds or species in search of a positive charge are called
   a) Electrophile  
   b) Nucleophile  
   c) Nitriles  
   d) None of the above

29. Which of the following is charged negatively
   a) Nucleophiles  
   b) Electrophiles  
   c) Both nucleophiles and electrophiles  
   d) None of the above

30. Alkyl halides are the derivatives of
   a) Alkyne  
   b) Alkene  
   c) Alkane  
   d) Benzene

31. Grignard’s reagent is
   a) alkyl halide  
   b) Magnesium halide  
   c) Alkyl magnesium halide  
   d) Ethereal solution of an alkyl halide

32. Grignard’s reagent reacts with water to form
   a) Alkane  
   b) Allkene  
   c) Alkyne  
   d) Ether

33. Which of the following carbonion is more stable?
   a) R₃C⁺  
   b) R₂C⁺H  
   c) RC⁺H₂  
   d) C⁺H₃

34. ‘R’ in organic chemistry stands for which radical?
   a) Alkyl  
   b) Aryl  
   c) Acyl  
   d) Carbonyl
42. R - CH₂ – X is an example of
   a) Primary alkyl halide
   b) Secondary alkyl halide
   c) Tertiary alkyl halide
   d) None of these

   Answer: A

43. A nucleophile is a
   a) Lewis acid
   b) Lewis base
   c) Bronsted acid
   d) Bronsted base

   Answer: B

44. An electrophile is a/an
   a) Lewis acid
   b) Lewis base
   c) Arrhenius acid
   d) Arrhenius base

   Answer: A

45. Rate determining step in SN₂ type reaction is always the
   a) Fast step
   b) Slow step
   c) Intermediate step
   d) None of these

   Answer: B

46. Ethyl bromide is formed by the reaction of HBr with
   a) Ethane
   b) Ethene
   c) Ethyne
   d) Propane

   Answer: B

47. The chemical reaction which involves the removal of hydrogen halide (H – X) from two adjacent carbon atoms of an organic molecule is called
   a) Dehydration
   b) Dehydrogenation
   c) Dehalogenation
   d) Dehydrohalogenation

   Answer: D

48. When metallic sodium in the presence of ether is heated with alkyl halide, a higher alkane is produced the reaction is called
   a) Hoffmann’s reaction
   b) Grignard’s reaction
   c) Wurtz reaction
   d) Haloform reaction

   Answer: C

49. Grignard’s reagent can be prepared by the reaction of alkyl halide with fresh magnesium turnings in the presence of
   a) Ether
   b) Anhydrous ether
   c) Water
   d) Sulphuric acid

   Answer: B

50. Species deficient in electrons are called
    a) Electrophiles
    b) Nucleophiles
    c) Oxidizing agent
    d) Bases

   Answer: A

52. Dehydrohalogenation of alkyl halide is carried on with
    a) Alcoholic KOH
    b) Alcoholic NaOH
    c) Aqueous KOH
    d) Aqueous NaOH

   Answer: A

53. A carbon atom carrying a positive charge and attached to three other atoms or group is called
    a) Carbonium ion
    b) Carbanion
    d) Carbene

   Answer: A

54. A carbon atom carrying negative charge and attached to three other atoms or groups is called
    a) Oxonium ion
    b) Carbanion
    d) Carbene

   Answer: C

56. In primary alkyl halides the halogen atom is attached to a carbon which is itself attached to
    a) One other carbon atom
    b) Two other carbon atoms
    c) Three other carbon atoms
    d) Four other carbon atoms

   Answer: A

58. Identify the compound is formed when formaldehyde reacts with CH₃ – Mg – Br, and is subsequently hydrolysed with dil HCl
    a) Ethyl alcohol
    b) Iso-propyl alcohol
    c) Tert- butyl alcohol
    d) Methyl alcohol

   Answer: A
01. The compounds in which C-atom of the benzene ring is directly attached with OH-group, are called ___________.
a) Phenols  
b) Halides  
c) Alcohols  
d) None of these  
A

03. When the C-atom of open chain is directly bonded with OH-group then the compound formed are called ___________.
a) Halides  
b) Alcohols  
c) Benzene  
d) None of these  
B

04. The formula for propyl alcohol is ___________.
a) CH₃OH  
b) C₂H₅OH  
c) CH₃-CH₂-OH  
d) CH₃-CH₂-CH₂-OH  
D

05. The general formula for primary alcohol is ___________.
a) R – OH  
b) R – Cl  
c) R – NH₃  
d) None of these  
A

06. The general formula for secondary alcohol is ___________.

07. The general formula for tertiary alcohol is ___________.
a) R – OH  
b) R – Cl  
c) R – C – OH  
d) R – C – Cl  
C

08. The alcohols which contain only one OH—group, are called ___________ alcohols.
a) Monohydric  
b) Dihydric  
c) Complex  
d) Simple  
A

09. We can represent n-propyl alcohol as ___________.
a) CH₃ - OH – CH₃  
b) CH₂ – CH₂ – CH₂ – OH  
c) CH₃ – CH₂ – OH  
d) None of these  
B

10. The alcohols containing two OH – groups are called ___________ alcohols.
a) Formic  
b) Benzoic  
c) Dihydric  
d) Trihydric  
C

11. The formula for glycol is ___________.
a) CH₂OH  
b) CH₃R  
c) CH₂ – CH₂  
d) CH₃ – CH₂ – OH  
C

12. The alcohols containing three OH – groups are called ___________ alcohols.
a) Trihydric  
b) Dihydric  
c) Simple  
d) Monohydric  
A
14. The alcohols which have more than one OH – groups are called ________ alcohols  a) Polyhydric b) Monohydric c) Simple d) Dihydric  A

15. The compounds in which C – atoms of carbonyl group is directly bonded with at least one H – atom, are called ________  a) Aldehydes b) Dihydric c) Monohydric d) Polyhydric  A

16. \( H \quad - \quad C \quad - \quad H \) is the formula for ________  a) Benzophenone b) Cyclohexanone c) Formaldehyde d) None of these  C

17. The compounds which are formed by the displacement of OH – group of carboxylic group by any halogen atom, are called ________  a) Acid halides b) Benzamide c) Formamide d) None of these  A

18. The compounds which are formed by the displacement of OH – group of carboxylic group by an amino group, are called ________  a) Acid halides b) Acid amides c) Esters d) Methanol  B

19. The formula for ethyl benzoate is ________  a) \( C_2H_5OH \) b) \( CH_3OH \) c) \( CH_3Cl + SO_2 + HCl \) d) \( CH_3 – CH_2 – OH \)  C

20. The formula for methanol is ________  a) \( C_2H_5OH \) b) \( CH_3OH \) c) \( CH_3Cl \) d) None of these  B

21. \( CO + 2H_2 \xrightarrow{400–450^\circ C} ________ \)  a) \( CH_3OH \) b) \( C_3H_6OH \) c) \( CO_2 + H_2 \) d) \( C_2H_2O_2 \)  A

22. \( CH_3 – OH + SOCl_2 \rightarrow ________ \)  a) \( 2C_2H_5OH \) b) \( CH_3OH + H_2O \) c) \( CH_3Cl + SO_2 + HCl \) d) None of these  C

23. Methanol is used to prepare ________  a) Formaldehyde b) Oxygen c) Hydrogen d) Alcohol  A

24. Methanol is used to prepare in paints and ________  a) Acids b) Base c) Varnish d) None of these  C

25. Ethyl alcohol is prepared by the fermentation of ________  a) Starch b) Water c) Soil d) Fire  A
26. When primary alcohols react with acidified \( \text{K}_2\text{Cr}_2\text{O}_7 \), then _______ are formed
   
   a) Methyl alcohol  
   b) Aldehydes  
   c) Oxygen  
   d) Hydrogen
   
   **B**  

27. \( \text{C}_2\text{H}_5\text{OH} + \text{HCl} \xrightarrow{\Delta H} \)  
   a) \( \text{C}_2\text{H}_5(\text{OH})_2 + \text{Cl}_2 \)  
   b) \( \text{C}_2\text{H}_5\text{Cl} + \text{H}_2\text{O} \)  
   c) \( \text{C}_2\text{H}_5 + \text{HCl} \)  
   d) None of these
   
   **B**  

28. The process to prepare esters, is called __________
   
   a) Esterification  
   b) Ethers  
   c) Alkyl halides  
   d) Halogens
   
   **A**  

29. Ethyl alcohol is used to purify __________
   
   a) \( \text{NaCl} \)  
   b) \( \text{Na}_2\text{CO}_3 \)  
   c) \( \text{NaOH} \)  
   d) None of these
   
   **C**  

31. Formaldehyde is also called __________
   
   a) Methanal  
   b) Alcohol  
   c) Acetone  
   d) Bakelite
   
   **A**  

32. The formula for acetaldehyde is __________
   
   a) \( \text{CH}_3\text{CHO} \)  
   b) \( \text{CH}_2\text{OH} \)  
   c) \( \text{CH}_3\text{OH} \)  
   d) \( \text{CH}_3\text{OH} \)
   
   **B**  

35. The formula for acetic acid is __________
   
   a) \( \text{CH}_3\text{COOH} \)  
   b) \( \text{C}_2\text{H}_5\text{OOH} \)  
   c) \( \text{CH}_3\text{OH} \)  
   d) \( \text{CH}_3\text{OH} \)
   
   **A**  

37. The formula for phenol is __________
   
   a) \( \text{C}_6\text{H}_5\text{–OH} \)  
   b) \( \text{CH}_3\text{–OH} \)  
   c) \( \text{C}_6\text{H}_5\text{–OH} \)  
   d) \( \text{CH}_3\text{–Cl} \)
   
   **A**  

39. The phenol is a __________ antiseptic
   
   a) Low  
   b) Great  
   c) Powerful  
   d) Hydroxide
   
   **C**  

40. The formula for ethyl bisulphate is __________
   
   a) \( \text{C}_2\text{H}_5\text{HSO}_4 \)  
   b) \( \text{C}_2\text{H}_5\text{OH} \)  
   c) \( \text{CH}_3\text{OH} \)  
   d) \( \text{CH}_3\text{Cl} \)
   
   **A**  

1219. When phenol is reduced in the presence of Zn dust, we get
   
   a) Cyclohexene  
   b) Cyclohexane  
   c) Benzene  
   d) Benzyne
   
   **C**  

1220. Alcohol reacts with halogen acid to produce
   
   a) Alkyl halides  
   b) Aldehydes  
   c) Ketones  
   d) Alkanes
   
   **A**  

1221. Acetone may be converted to iodoform by heating with
   
   a) \( \text{Br}_2 \)  
   b) \( \text{I}_2 \)  
   c) \( \text{F}_2 \)  
   d) \( \text{Cl}_2 \)
   
   **B**  

1222. Nitration of phenol gives
   
   a) O-nitrophenol  
   b) p-nitrophenol  
   c) m-nitrophenol  
   d) Both O and p-nitrophenol
   
   **D**  

1223. The functional group aldehyde is
   
   a) \( \text{R} \text{–X} \)  
   b) \( \text{–COX} \)  
   c) \( \text{–CHO} \)  
   d) \( \text{–COOR} \)
   
   **C**  

1224. Which of the following is used as anesthetics?
   
   a) Alcohol  
   b) Ether  
   c) Aldehyde  
   d) Acid
   
   **B**
1225. Treatment of a secondary alcohol with a suitable oxidizing agent (K$_2$Cr$_2$O$_7$) results in the formation of
   a) Ketone        b) Aldehyde
   c) Ether          d) Alkyl halide
   A

1226. Which of the following is a chief constituent of vinegar?
   a) Alcohol   b) Glucose
   c) Sucrose   d) Acetic acid
   D

1229. The formaldehyde in the presence of K$_2$Cr$_2$O$_7$ and H$_2$SO$_4$ gives
   a) Ethanol   b) Acetic acid
   c) Formic acid   d) None of these
   C

1230. The formula of glycine is
   a) Cl—CH$_2$—COOH   b) NH$_2$—CH$_2$—COOH
   c) NO$_2$—CH$_2$—COOH   d) None of these
   B

1233. Which of the following is known as wood spirit?
   a) ethyl alcohol   b) propyl alcohol
   c) methyl alcohol   d) butyl alcohol
   C

1234. Methyl alcohol possesses
   a) burning taste   b) poisonous
   c) causing madness   d) all these
   D

1235. Oxidation of methyl alcohol gives
   a) formaldehyde   b) acetone
   c) ester   d) acid
   A

1237. The malt-sugar in the presence of yeast or invertase gives
   a) fructose   b) glucose
   c) lignin   d) alcohol
   B

1238. Glucose in the presence of zymase is converted into
   a) alcohol   b) acid
   c) ethyl alcohol   d) ketone
   C

1239. Alcohols react with carboxylic acids, acid halides, acid anhydrides to produce the class of compounds known as
   a) Grignard’s reagent   b) esters
   c) amides   d) none of these
   B

1240. Dehydration of ethyl alcohol yields
   a) aldehyde   b) ketone
   c) acid   d) alkene
   D

1241. Ethyl alcohol may be identified by
   a) ring test   b) iodoform test
   c) tollen’s test   d) Baeyer’s test
   B

1242. Oxidation of formaldehyde yields
   a) acetic acid   b) formic acid
   c) sulphuric acid   d) lactic acid
   B

1243. Formaldehyde on reduction gives
   a) methyl alcohol   b) ethyl alcohol
   c) formic acid   d) acetic acid
   A

1244. Which of the following gives Fehling’s solution test positive?
   a) aldehyde   b) ketone
   c) acid   d) ester
   A

1247. The oxidation of acetaldehyde gives
   a) propanol   b) acetone
   c) formic acid   d) acetic acid
   D
1249. Acetic acid reacts with thionyl chloride to give  
a) acetic anhydride  
b) acetyl chloride  
c) ethyl acetate  
d) none of these  
B

1250. Oxidation of 2-propanol gives  
a) propanone  
b) butanone  
c) pentanone  
d) none of these  
A

1251. The hydroxyl derivatives of aromatic hydrocarbons which have the —OH group directly bonded to the ring C-atom are called  
a) alcohols  
b) ketones  
c) esters  
d) phenols  
D

1252. Dow’s process is used for the preparation of  
a) esters  
b) ethers  
c) alcohols  
d) phenols  
D

1253. Which of the following is weakly acidic in nature?  
a) alcohol  
b) phenol  
c) aldehyde  
d) amide  
B

1254. Phenol is used in the preparation of  
a) aspirin  
b) phenacetin  
c) salol  
d) all of these  
D

1256. Which of the following is produced when an aqueous solution of butan-2-ol is refluxed with dil acidified KMnO4?  
a) Butanol  
b) Butanoic acid  
c) Butanone  
d) Butene  
C

1272. Which one of the following compounds gives an immediate precipitate with aqueous silver nitrate?  
a) CH₃CH₂CH₂Cl  
b) CH₃CCl₃  
c) CH₂COCl  
d) C₆H₅Cl  
C

1275. Which class of compounds is commonly used for the artificial flavouring in jams?  
a) Aldehydes  
b) Ketones  
c) Carboxylic acids  
d) Esters  
D

938. Rectified spirit contains  
a) 95.6 % alcohol  
b) 75.0 % alcohol  
c) 100.0 % alcohol  
d) 85.4 % alcohol  
A

939. Alcoholic fermentation is brought out by the action of  
a) Yeast  
b) CO₂  
c) O₂  
d) CO  
A

940. What is the end product in the process of fermentation  
a) Methyl alcohol  
b) Ethanol  
c) CH₃CHO  
d) Ethylene  
B

941. Which is an isomer of ethanol  
a) CH₃OH  
b) CH₂OCH₃  
c) C₂H₅OC₂H₅  
d) C₆H₅OH  
B

942. Glycerine is a  
a) secondary alcohol  
b) tertiary alcohol  
c) trihydric alcohol  
d) ester  
C

945. A product formed by the reaction of sodium with ethanol is  
a) H₂O  
b) NaOH  
c) NaH  
d) H₂  
D

946. Which of the following alcohols is least soluble in water  
a) CH₃OH  
b) C₂H₅OH  
c) C₆H₅OH  
d) C₁₀H₂₁OH  
D
955. Aldehydes may be distinguished from ketones by the use of:  
a) conc H₂SO₄  
b) Grignard’s reagent  
c) Pyrogallol  
d) Fehlings solution

956. An aldehyde on oxidation gives:  
a) an alcohol  
b) a ketone  
c) an acid  
d) an amine

961. Which compound undergoes iodoform reaction:  
a) HCHO  
b) (CH₃)₂CO  
c) CH₃OH  
d) CH₂CICOOH

969. The reagent that reacts easily with both acetaldehyde and acetone is:  
a) Fehlings solution  
b) Grignard’s reagent  
c) Schiff’s reagent  
d) Tollen’s reagent

974. Williamson’s synthesis is used to prepare:  
a) acetone  
b) P.V.C  
c) bakelite  
d) diethylether

977. The reaction, in which an alkyl halide reacts with sodium alkoxide to produce ether, is known as:  
a) hydrolysis  
b) kolbe’s reaction  
c) Williamson’s synthesis  
d) Wurtz reaction

978. According to lewis concept, ethers behave as:  
a) acid  
b) base  
c) neutral  
d) none of the above

981. On heating ethyl ether to 400°C in the presence of Al₂O₃ we get:  
a) acetylene  
b) ethylene  
c) ethane  
d) ethyl alcohol

983. The reaction of formic acid with concentrated H₂SO₄ gives:  
a) CH₂COOH  
b) HCN  
c) CO₂  
d) CO

984. The acid present in vinegar is:  
a) CH₃COOH  
b) HCl  
c) H₂SO₄  
d) HNO₃

- 6 -
01. The group of chemical substances which take part in the life sustaining processes and gives us energy, is called ________
   a) Food
   b) Energy
   c) Catalyst
   d) Minerals

   ➢ Answer: a) Food

02. The components of food which deals with different functions, are called
   a) Carbohydrates
   b) Nutrients
   c) Starch
   d) None of these

   ➢ Answer: b) Nutrients

03. Fats, minerals and water, are all called__________
   a) Food
   b) Material
   c) Nutrients
   d) None of these

   ➢ Answer: c) Nutrients

04. Digestion is a process in which non-diffusible organic molecules are changed into__________ smaller molecules
   a) Proteins
   b) Fats
   c) Vitamins
   d) Diffusible

   ➢ Answer: a) Proteins

06. For vital processes, the__________ is the most important source of energy.
   a) Maltose
   b) Carbohydrate
   c) Complex
   d) Sugar

   ➢ Answer: b) Carbohydrate

07. The formula for glucose is__________
   a) C₆H₁₂O₆
   b) CO₂
   c) CH₃OH
   d) C₁₅H₃₁

   ➢ Answer: a) C₆H₁₂O₆

08. For all living cells, the protein is an important__________
   a) Polymer
   b) Constituent
   c) Fat
   d) None of these

   ➢ Answer: b) Constituent

10. The hydrates of carbon, are called__________
    a) Amino acids
    b) Carbohydrates
    c) Proteins
    d) Polysaccharides

   ➢ Answer: d) Polysaccharides

11. The general formula for carbohydrates, is__________
    a) C₆H₁₂O₆
    b) C₆H₂₉₂
    c) C₆(H₂O)ₙ
    d) None of these

   ➢ Answer: a) C₆H₁₂O₆

12. 6CO₂ + 6H₂O $\xrightarrow{\text{sunlight}}$ __________
    a) C₆H₁₂O₆ + 6O₂
    b) C₆H₂O₆ + 6H₂O
    c) C₆H₁₂O₆ + ΔH
    d) C₆H₂O₆ + ΔH

   ➢ Answer: d) C₆H₂O₆ + ΔH

13. There are__________main types of carbohydrates.
    a) Five
    b) Three
    c) Two
    d) Four

   ➢ Answer: b) Three

14. Monosaccharides are the__________carbohydrates.
    a) Simplest
    b) Complex
    c) Equal
    d) None of these

   ➢ Answer: a) Simplest

15. Aldoses are those carbohydrates which contain__________functional group.
    a) Ketonic
    b) Simple
    c) Aldehydic
    d) None of these

   ➢ Answer: c) Aldehydic

16. The carbohydrates containing__________functional group, are called ketoses
    a) Ketonic
    b) Aldehydic
    c) Ketosis
    d) Complex

   ➢ Answer: a) Ketonic

17. Glucose is an example of__________.
    a) Fructose
    b) Aldoses
    c) Ketoses
    d) Protein

   ➢ Answer: b) Aldoses
18. Fructose is an example of __________
a) Ketoses b) Aldoses
c) Sunlight d) Protein
19. The glucose produces __________ for our body.
a) Starch b) Amylose
c) Energy d) None of these
20. Polysaccharides are partially __________ in water.
a) Soluble b) Insoluble
c) Difference d) None of these
21. We can get vitamin-A from __________
a) Cow and fish b) Milk and fish.
c) Cow and tomatoes d) None of these
22. We can get vitamin-D from __________
a) Meat and fish b) Meat and tomatoes
c) Glucose and fish d) Glucose and tomatoes
23. We can get vitamin-E from __________
a) Folic acid and cow. b) Milk and vegetables oils
c) Milk and tomatoes d) None of these
24. We can get vitamin-C from __________
a) Orange and Lemon b) Milk and fish
c) Milk and orange d) None of these
25. There are __________ types of amino acids.
a) Five b) Three
c) Four d) Nine
26. The amino acids which cannot be synthesized in our body, are called __________ amino acids.
a) Essential b) Compound
c) Fatty acids d) None of these
27. The amino acids which are synthesized in our body, are called __________ amino acids.
a) Essential b) Non-essential
c) General d) Compound
28. The diet of an average person constitutes about __________ edible lipids.
a) 25 – 28 % b) 30 – 35 %
c) 60 – 80 % d) 90 – 95 %
29. The solid states of esters of fatty acids and glycerol are generally called __________.
a) Oils b) Fats
c) Fatty acids d) None of these
30. The liquid state of fat is called an __________
a) Oil b) Fat
c) Vegetable ghee d) None of these
31. The activity of an enzyme depends upon the factor __________
a) Temperature b) Enzymes
c) Complex d) None of these
32. Undernutrition is the effect of a diet, efficient in __________.
a) All nutrients b) Compounds
c) Catabolism d) Nutrient
33. During anabolism energy is __________
   a) Glucose   b) Absorbed   c) Milk   d) Fish
   B
34. Glucose is an example of __________ nutrient food.
   a) Milk   b) Fish   c) Single   d) Double
   C
35. The total carbohydrates in plants vary from __________ of the dry mass of a plant.
   a) 60 to 90 %   b) 60 to 100 %   c) 50 to 80 %   d) 120 to 150 %
   A
36. A common pentose is __________
   a) Good food   b) Ribose   c) Extrose   d) Egg
   B
37. Common table sugar called sucrose belongs to __________
   a) Oligosaccharides   b) Fats   c) Minerals   d) None of these
   A
38. Amino acids are the basic construction units of __________.
   a) Fats   b) Proteins   c) Glucose   d) Fatty acids
   B
39. Hydrolysis of proteins gives __________.
   a) Amino acids   b) Fatty acids   c) Glucose   d) Mineral acids
   A
40. Peanut oil contains vitamin __________.
   a) R and C   b) K   c) M   d) D
   B
01. The branch of chemistry that deals with the chemical processes occurring in the living matter
    ranging from viruses and bacteria to plants and animals is called:
   a) Analytical chemistry   b) Biochemistry   c) Nuclear chemistry   d) Stereo-chemistry
   B
02. The group of chemical reagents required by the living matter to maintain life is called:
    a) Food   b) Diet   c) Nutrient   d) Nutrition
    A
03. The daily food intake or eating pattern of living matter is called:
    a) Anabolism   b) Catabolism   c) Diet   d) Food
    C
04. The component of food that promotes the growth, maintenance, function and reproduction of living
    matter is called:
    a) Metabolite   b) Diet   c) Food   d) Nutrient
    D
05. The effect of a diet, containing lesser quantity of any one nutrient than its minimum requirement is
    called:
    a) Over nutrition   b) Malnutrition   c) Under nutrition   d) Proto nutrition
    B
07. The chemical reaction in which larger nutrient molecules break into smaller molecules in the living
    matter is called:
    a) Metabolism   b) Metabolite   c) Catabolism   d) Anabolism
    C
08. The chemical reaction in which smaller nutrients molecules combine to form bigger molecules in the living matter is called:
   a) Anabolism  
   b) Catabolism  
   c) Metabolism  
   d) Nutrientism
   - A

09. Energy is released during …………
   a) Anabolism  
   b) Catabolism  
   c) Parabolism  
   d) Orthobolism
   - B

10. During anabolism energy is:
   a) Remained same  
   b) Not changed  
   c) Released  
   d) Absorbed
   - D

11. Metabolism is the sum of anabolism and:
   a) Parabolism  
   b) Orthobolism  
   c) Protobolism  
   d) Catabolism
   - D

12. The reactants involved in the metabolism of living system are called:
   a) Nutrients  
   b) Substrates  
   c) Metabolites  
   d) products
   - C

13. Food are divided on the basis of number of ………. present in them.
   a) Colours  
   b) Tastes  
   c) Nutrients  
   d) Molecules
   - C

14. The food which contains only one nutrient is called:
   a) Double nutrient food  
   b) Single nutrient food  
   c) Triple nutrient food  
   d) Multi nutrient food
   - B

15. An example of single nutrient food is:
   a) Glucose  
   b) Egg  
   c) Milk  
   d) Fish
   - A

17. The compounds of C, H, and O, which contain H and O in the rations of water (2: 1) are called:
   a) Proteins  
   b) Fats  
   c) Carbohydrates  
   d) Carbonitrates
   - C

19. The aldehyde or ketone derivatives of polyhydric alcohols or the compounds which give these derivatives on hydrolysis are called………..
   a) Carbohydrates  
   b) Proteins  
   c) Fats  
   d) Steroids
   - A

20. The total carbohydrates in plants vary from ……….of the dry mass of a plant.
   a) 30 to 60 %  
   b) 60 to 90 %  
   c) 40 to 70 %  
   d) 50 to 75 %
   - B

21. Most of the carbohydrate of a plant is in the form of:
   a) Glycogen  
   b) Starch  
   c) Cellulose  
   d) Glucose
   - C

22. Carbohydrates which cannot be further hydrolyzed into smaller molecules are called:
   a) Extrasaccharides  
   b) Polysaccharides  
   c) Disaccharides  
   d) Monosaccharides
   - D

23. Trioses, tetroses, pentoses and hexoses contains 3, 4, 5 and 6 ………. atoms respectively.
   a) Carbon  
   b) Hydrogen  
   c) Oxygen  
   d) Nitrogen
   - A

25. Glucose is also called:
   a) Galactose  
   b) Fructose  
   c) Dextrose  
   d) Mannose
   - C
26. The carbohydrates consisting of 2-10 monosaccharide molecules condensed together with the loss of water molecules are called:
   a) Polysaccharides  
   b) Oligosaccharides  
   c) Decasaccharides  
   d) Multisaccharides  
   
   **D**

27. Oligosaccharides are also called …………
   a) Vitamins  
   b) Sugars  
   c) Minerals  
   d) Fats  

   **B**

29. Sucrose is hydrolyzed to give a molecule each of glucose and ……….
   a) Fructose  
   b) Ribose  
   c) Glycerose  
   d) Galactose  

   **A**

30. The carbohydrates consisting of a very large number of monosaccharide units condensed into straight and branched chain molecules with the general formula (C\(6\)H\(10\)O\(5\))\(n\) are called
   a) Polysaccharides  
   b) Oligosaccharides  
   c) Decasaccharides  
   d) Monosaccharides  

   **B**

31. Starch and cellulose are ………….. in taste
   a) Sweet  
   b) Sweetest  
   c) Tasteless  
   d) Sour  

   **C**

32. Human and many other animals cannot digest and use ………….. as a food
   a) Glucose  
   b) Fructose  
   c) Starch  
   d) Cellulose  

   **D**

33. Carbohydrates supply 16 – 75 caps of energy per:
   a) Gram  
   b) Miligram  
   c) Kilogram  
   d) Ounce  

   **A**

34. Colour of starch solution with iodine is:
   a) Red  
   b) Blue  
   c) Green  
   d) Yellow  

   **B**

35. Starch has branched chains with 1- 4 and 1 – 6 linkages in glucose units while cellulose has straight chain with ………….. only.
   a) 1 - 4 linkage  
   b) 1 - 2 linkage  
   c) 1 - 6 linkage  
   d) 1 - 3 linkage  

   **C**

37. Generally each amino acid carries one amino (-NH\(_2\)) and one …………..
   a) Carboxyl group  
   b) Carboxy group  
   c) Aldehyde group  
   d) Ether group  

   **A**

38. Zwitterion is a …………..
   a) Non-plar ion  
   b) Monopolar ion  
   c) Dipolar ion  
   d) Tripolar ion  

   **C**

39. The common name of amino acid, 2-amino propanoic acid, is ………….
   a) Lysine  
   b) Glycide  
   c) Asparagine  
   d) Glutamine  

   **B**

40. Example of amino acids with a non-polar R-group are:
   a) Glycine and serine  
   b) Lysine and arginine  
   c) Tyrosin and cystein  
   d) Alanine and valine  

   **D**

43. The number of essential amino acids for adults is:
   a) 8  
   b) 10  
   c) 9  
   d) 11  

   **B**

45. In proteins nitrogen is almost:
   a) 30 %  
   b) 16 %  
   c) 25 %  
   d) 8 %  

   **B**
47. Amino acids are generally .......... carboxylic acids of different molecular sizes.
   a) β- amino  
   b) γ- amino
   c) α- amino  
   d) d – amino
   C

48. The daily requirement of protein of an adult to keep constant weight is about .......... per kg of body weight.
   a) 8.0 grams  
   b) 0.8 grams
   c) 4.0 grams  
   d) 0.4 grams
   B

49. In milk protein is:
   a) 1.5 %  
   b) 30.0 %
   c) 10.0 %  
   d) 3.0 %
   D

50. Chicken contain .......... protein.
   a) 25%  
   b) 45 %
   c) 10 %  
   d) 35 %
   A

51. A group of heterogeneous water insoluble non-polar organic compounds of plant and animal origins is called:
   a) Carbohydrates  
   b) Proteins
   c) Lipids  
   d) Vitamins
   C

52. The diet of an average adult contains about .......... Lipids:
   a) 15 – 2 %  
   b) 10 - 15%
   c) 20 - 25 %  
   d) 25 – 28 %
   D

53. Each gram of lipid produces .......... of energy.
   a) 3.77 KJ  
   b) 377 KJ
   c) 37.7 KJ  
   d) 100 KJ
   C

54. Vital organs such as heart, liver, brain and kidneys are protected from shocks and strains by layers of .......... 
   a) Proteins  
   b) Lipids
   c) Carbohydrates  
   d) Vitamins
   B

55. Per hydrocyclopentanophenanthracene structure is the result of fusion of phenanthracene and .......... 
   a) Cyclopentane ring  
   b) Cyclobutane ring
   c) Cyclohexane ring  
   d) Benzene ring
   A

56. The increased quantity of .......... in blood make plague like deposits in the arteries causing blood pressure and heart diseases.
   a) Urea  
   b) Water
   c) Glucose  
   d) Cholesterol
   D

57. Triglycerides are the esters of fatty acids and .......... 
   a) Methanol  
   b) Ethanol
   c) Glycerol  
   d) Glycol
   C

58. The fatty acids, having alkyl groups containing C — C single bonds are called .......... fatty acids.
   a) Unsaturated  
   b) Saturated
   c) Basic  
   d) Neutral
   B

59. Alkyl groups of unsaturated fatty acids contains at least one carbon – carbon .......... 
   a) Double bond  
   b) Single bond
   c) Covalent bond  
   d) Ionic bond
   A

60. Iodine number in the number of grams of iodine consumed by .......... grams of fat or oil.
   a) 1  
   b) 1, 000
   c) 10  
   d) 100
   D

61. The addition of hydrogen to unsaturated vegetable oils to convert them into the solid state is called: .......... 
   a) Hardening  
   b) Softening
   c) Liquefaction  
   d) Solidification
   A
64. Hydrogen gas is passed through oil at higher temperature and in the presence of …… as catalyst.  
a) Cu  
b) Ni  
c) Pt  
d) Pd  
  B  

65. Milk, fat, butter, cream and fish liver oil contain vitamin ……  
a) B and D  
b) E and K  
c) B and C  
d) A and D  
  D  

66. The development of unpleasant smell in a fat or oil is called ……..  
a) Rancidity  
b) Saponification  
c) Fermentation  
d) Hardening  
  A  

67. The hydrolysis of a fat or oil with an alkali to form soap and glycerol is called:  
a) Rancidity  
b) Saponification  
c) Hydrogenation  
d) Hardening  
  B  

68. The complex organic compounds which act as catalyst and facilitate the normal growth of the body are called:  
a) Proteins  
b) Alkaloids  
c) Steroids  
d) Vitamins  
  D  

70. The first discovered vitamin was:  
a) Niacin  
b) Biotic  
c) Thiamine  
d) Ascorbic acid  
  C  

71. Thiamine vitamin cure the disease:  
a) Beri beri  
b) Cholera  
c) Fever  
d) Headache  
  A  

72. So far …….. vitamins have been discovered:  
a) 11  
b) 13  
c) 15  
d) 9  
  B  

73. The last discovered vitamin was vitamin:  
a) M  
b) K  
c) B6  
d) B12  
  D  

74. Fat soluble vitamins include A, D, E and:  
a) B  
b) G  
c) K  
d) C  
  C  

75. Excessive vitamin D causes bone pains, deposition of stones in the kidneys and ……..  
a) Mental retardation  
b) Stomachache  
c) Diabetes  
d) Cholera  
  A  

76. Water soluble vitamins are vitamins B and:  
a) K  
b) C  
c) A  
d) D  
  B  

77. Vitamin B comprises a group of vitamins called ………  
a) Vitamins B1, B12  
b) Vitamin B simplex  
c) Vitamin B exact  
d) Vitamin B complex  
  D  

78. The excessive intake of water soluble vitamins is not harmful because these are excreted in ……  
a) Breathing  
b) Urine  
c) Sweat  
d) Feces  
  B  

79. The complex nitrogenous organic compounds which are produced by living cells and act as catalyst in biochemical reactions are called:  
a) Hormones  
b) Enzymes  
c) Coenzymes  
d) Vitamins  
  B  

80. Enzymes are in fact …….. in nature.  
a) Carbohydrate  
b) Alkaloids  
c) Lipids  
d) Protein  
  D
81. The substance on which an enzyme acts is called:
   a) Reactant  b) Product  c) Substrate  d) Metabolite
   C

82. The amount of an enzyme which can convert one micro-mole of substrate in one minute under the given conditions of temperature, pH and substrate concentration is called ............
   a) Unit of enzyme  b) Turn over  c) Potency  d) Specific activity
   A

83. The number of units of enzyme activity per milligram of protein is called:
   a) Unit of enzyme  b) Turn over  c) Measuring unit  d) Magnitude
   B

84. The number of moles of a substrate converted by one mole of an enzyme per minute at a given temperature is called:
   a) Used over  b) Potency  c) Turn over  d) Turn under
   C

85. The specific location on the surface of the enzyme at which substrate combines to form complex and is converted into the product is called:
   a) Enzyme site  b) Non-active sites  c) Passive site  d) Active site
   D

86. The rate of a reaction is directly proportional to the concentration of ............
   a) Product  b) Enzyme  c) Substrate  d) Coenzyme
   C

87. The maximum concentration of substrate above which increase of substrate concentration does not increase the rate of reaction is called ............ of enzyme with substrate
   a) Termination  b) Saturation  c) Fluctuation  d) Maximum optimisation
   B

88. The temperature at which the activity of an enzyme is maximum is called ............
   a) Optimum temperature  b) Maximum temperature  c) Minimum temperature  d) Saturation temperature
   A

89. The rate of a reaction is directly proportional to the square root of the concentration of ............
   a) Coenzyme  b) Enzyme  c) Substrate  d) Reactants
   B

90. Majority of enzymes have an optimum temperature of :
   a) 37°C  b) 55°C  c) 45°C  d) 25°C
   C

91. All the enzymes are either destroyed or inactivated above pH ............
   a) 7  b) 8  c) 12  d) 10
   D

92. The proteinous part of the conjugated protein or enzyme is called:
   a) Activator  b) Coenzyme  c) Apoenzyme  d) Substrate
   A

93. The inorganic substances which increase the enzyme activity are called:
   a) Inhibitor  b) Activator  c) Coenzyme  d) Substrate
   B

94. The substances which reduce the enzyme activity are called:
   a) Coenzyme  b) Apoenzyme  c) Activator  d) Inhibitor
   D

95. The process in which the products of digestion are used by the animal body for energy purpose or for synthesis of cellular structure is called:
   a) Assimilation  b) Absorption  c) Respiration  d) Excretion
   A
97. The loss of natural structure of a protein is called …………… of protein.
   a) Naturation  
   b) Break down  
   c) Denaturation  
   d) Spoilage
   
   C
CHEMISTRY-XII

Chapter 11

CHEMICAL INDUSTRIES IN PAKISTAN

01. The chemical substance which are added in the land for the growth of plans, are called.
   a) Fertilizers   b) Soils   c) Water   d) Sand
   1
   A

02. The elements required in a large amount for the process, is called.
   a) Simple   b) Major   c) Natural   d) Synthetic
   2
   B

03. There are ______ main types of fertilizers.
   a) Four   b) Five   c) Two   d) Six
   3
   C

04. Ammonia contains_______ N₂.
   a) 28%   b) 34%   c) 63%   d) 82%
   4
   D

05. Ammonia nitrate contains__________ N₂
   a) 32 - 33.5%   b) 42 - 43.5%   c) 62 - 63.5%   d) 84 - 85.5%
   5
   D

06. When “NH₃” react with “HNO₃” then ______ reaction takes place.
   a) NH₃ + HNO₃ → NH₄ + NO₃
   b) NH₃ + HNO₃ → NH₄NO₃
   c) NH₄ + HNO₃ → NH₄⁺ + OH
   d) None of these
   6
   B

07. Ammonium sulphate contains __________ N₂
   a) 21%   b) 12%   c) 34%   d) 43%
   7
   A

08. Ammonium sulphate contains __________ S
   a) 31%   b) 25%   c) 52%   d) 65%
   8
   B

09. 2NH₃+H₂SO₄ → ________.
    a) NH₄ (OH)₃   b) (NH₄)₂(OH)₃
    c) (NH₄)₂ SO₄   d) None of these
   9
   C

10. Urea contains___________ N₂
    a) 46%   b) 64%   c) 12%   d) 96%
    10
    A

11. CH + 2H₂O  \(\xrightarrow{Ni\ 900^\circ C}\) ________.
    a) C+ 3 H₂O   b) CO₂ + 4H₂
    c) CO+ 3 H₂O   d) C+ 4H₂O
    11
    B

14. 2NH₃+ CO₂ → ________.
    a) NH₂COONH₄   b) CH₂COONH₂
    c) NH₃   d) CO₂+4H₂
    12
    A

15. Diammonium phosphate contains _________ N₂
    a) 26%   b) 16%
    c) 62%   d) 42%
    13
    B

20. Potassium chloride contains__________ potash
    a) 60-63%   b) 48-52%
    c) 70-74%   d) 80-84%
    14
    B

21. The formula of potassium sulphate is ____________.
    a) K₂SO₄   b) H₃PO₃
    c) HCl   d) HNO₃
    15
    A
22. \( \text{K}_2\text{SO}_4 \) contains_________ potash.
   a) 68-82%   b) 48-52%
   c) 78-84%   d) 90-95%

23. \( 2\text{KCl} + \text{H}_2\text{SO}_4 \rightarrow \) ________.
   a) \( \text{K}_2\text{SO}_4 + 2\text{HCl} \)
   b) \( \text{K}_2\text{SO}_4 + 2\text{H}_2\text{O} \)
   c) \( \text{K}_2\text{SO}_4 + 4\text{H}_2\text{O} \)
   d) None of these

24. Glass is super cooled__________.
   a) Liquid   b) Gas
   c) Molecule d) None of these

25. The main former of glass is.
   a) Nitrogen   b) Plastic
   c) Silica     d) Soda

26. The example of vegetable fiber is.
   a) Water     b) Cotton
   c) Plastic   d) Soda

28. Polyvinyl chloride is a _______ plastic.
   a) Super     b) Low
   c) Thermo    d) Benzene

29. The mixed ingredients of glass are melted at about ________.
   a) 49°C     b) 1400°C
   c) 1600°C   d) 2000°C

30. Natural fiber is obtained from the ________ source.
   a) Natural   b) Simple
   c) Different d) Complex

01. The fiber in which the basic polymer is a long chain composed of at least 85% by weight of acrylonitrile unites is called
   a) Acrylic fiber
   b) Modacrylic fiber
   c) Polyester fiber
   d) None of the above

02. What is the chemical name of the substance represented by the formula \( (\text{NH}_2)_2\text{CO} \)?
   a) Methylamide
   b) Carbamide
   c) Urea
   d) Benzamide

03. A mixture of potassium and calcium silicates form
   a) Soft glass
   b) Hard glass
   c) Flint glass
   d) Pyrex glass

04. The fiber which is made from vinylidine chloride polymer is called
   a) Rayon fiber
   b) Azlon fiber
   c) Acetate fiber
   d) Saran fiber

05. The basic fiber forming long chain polymers in nylon is
   a) 46
   b) 56
   c) 66
   d) None of the above

06. The basic fiber forming long chain polymers in nylon is
   a) Vinylidine chloride
   b) Natural protein
   c) Polyamide
   d) None of the above

08. The main source of natural fiber is.
   a) Animal fibers
   b) Vegetable fibers
   c) Mineral fibers
   d) All of the above

11. The chemical substance which are used to add one or more nutrients to the soil required for the growth of plants are.
   a) Fertilizers
   b) Minerals
   c) Both Fertilizers and Minerals
   d) None of the above
12. The elements required in small amounts are called.
   a) Nutrients  b) Micro nutrients  c) Minerals  d) None of these
   B

13. Fertilizers are classified in to _______ major categories.
   a) Three  b) Two  c) Five  d) Four
   B

14. The natural fertilizers consist of ____________.
   a) Plants  b) Animals  c) Both plants and animals  d) None of the above
   C

15. Nitrogen is required by the soil in.
   a) Large quantities  b) Small quantities  c) Very small quantities  d) None of the above
   A

16. The natural fertilizer is called.
   a) Nanure  b) Urea  c) Super phosphate  d) None of the above
   B

17. Ammonia contains about________ nitrogen.
   a) 70%  b) 39%  c) 75%  d) 82%
   D

18. Ammonium nitrate is formed by the action of.
   a) Ammonia and nitric acid  b) Ammonia and carbon dioxide  c) Ammonia and hydrogen  d) None of the above
   A

19. Dehydration of ammonium carbonate gives us.
   a) Ammonium nitrate  b) Ammonium sulphate  c) Urea  d) Potassium sulphate
   C

20. The most commonly and widely used nitrogen fertilizer in Pakistan is.
   a) Urea  b) Ammonium nitrate  c) Ammonium sulphate  d) None of the above
   A

22. In which state ammonia is used as a fertilizer.
   a) Liquid  b) Solid  c) Gas  d) All of the above
   C

23. Which of the following fertilizers is useful for paddy rice.
   a) Ammonium nitrate  b) Ammonium sulphate  c) Urea  d) None of the above
   B

24. What percentage of urea does contain nitrogen.
   a) 46%  b) 66%  c) 36%  d) 86%
   A

26. The production of which of the following fertilizers is insufficient in Pakistan.
   a) Nitrogen  b) Potassium  c) Phosphorus  d) None of the above
   C

27. The basic fiber forming long chain polymer in azion fiber is a.
   a) Natural probin  b) Polymide  c) Vinyldine chloride  d) None of the above
   A

29. Bakelite is a.
   a) Glass  b) Fiber  c) Plastic  d) None of the above
   C
32. Soaps are the.
   a) An Ionic surfactants
   b) Cationic surfactants
   c) Non-Ionic surfactants
   d) None of the above

34. The production of glass consists of soda–lime glass about.
   a) 90%
   b) 70%
   c) 80%
   d) 75%

35. Which of the following is required by the soil in large quantities?
   a) Nitrogen
   b) Hydrogen
   c) Both nitrogen and hydrogen
   d) None of the above

36. Plasticizers make the plastics.
   a) Harden
   b) Soften
   c) Neither harden nor soften
   d) Both harden and soften

38. Air pollution is caused by.
   a) Carbon dioxide
   b) Fluorocarbons
   c) Hydro carbons
   d) None of the above

39. Wooden articles are painted to project the norm from.
   a) Corrosion
   b) The effects of weather
   c) Both corrosion and the effects of weather
   d) None of the above

40. Varnishes are mostly used on.
   a) Wood
   b) Plastic
   c) Iron
   d) All of the above

41. The film forming components of paints are.
   a) Resins
   b) Thinners
   c) Pigments
   d) Driers

42. Main classes of plastics are .
   a) Three
   b) Two
   c) Five
   d) Six

43. Petroleum products are the good source of raw materials for.
   a) Glass
   b) Plastics
   c) Fiber
   d) All of the above

44. The plastics which soften on heating and harden on cooling without undergo any chemical change are.
   a) Thermoplastic
   b) Thermosetting plastic
   c) Both of the above
   d) None of the above

45. Ceramics industry deals with the production of.
   a) Cement
   b) Glass
   c) Paper
   d) Pottery

47. Glass is classified into different types on the basis of its.
   a) Chemical composition
   b) Physical properties
   c) Manufacturing process
   d) All of the above

49. Which of the following is a synthetic fertilizer?
   a) Plant, leave under fermentation
   b) Urea
   c) Animal excretes
   d) Animal bones

51. What do you see as the main problem of Pakistan?
   a) Unemployment
   b) Growing population
   c) Clean drinking water
   d) Shortage of food

54. Detergents are.
   a) Synthetic products
   b) Natural products
   c) Both (a) and (b)
   d) None of the above
55. Which of the following nitrogen fertilizer contains more nitrogen?
   a) NaNO₃  
   b) KNO₃ 
   c) NH₄NO₃  
   d) Urea  
   D
### INTRODUCTION TO FUNDAMENTAL CONCEPTS OF CHEMISTRY

01. Chemistry is the branch of science, which deals with composition, structure, properties, ______ in matter and change in energy.
   a) Change  
   b) Construct  
   c) Inorganic  
   d) None of these  (A)

02. The branch of chemistry, which deals with the compounds of carbon and hydrogen is called
   a) In organic chemistry  
   b) Organic chemistry  
   c) Industrial chemistry  
   d) Analytical chemistry  (B)

04. A substance is a_________ of pure matter
   a) Usually  
   b) Kilogram  
   c) Sample  
   d) Properties  (C)

05. The material is called an element, if the all atoms of a substance are chemically_______.
   a) Change  
   b) Same  
   c) Simple  
   d) Different  (B)

07. Melting of ice is _______ change
   a) Physical  
   b) Chemical  
   c) Simple  
   d) Poly atomic  (A)

09. The process which deals with the breakage and formation of bond and a new substance is formed during this process, is called.
   a) Physical change  
   b) Chemical change  
   c) Rusting  
   d) None of these  (B)

13. No new substance is formed in the ________ change
   a) Chemical  
   b) Physical  
   c) Volume  
   d) None of these  (B)

14. Chemical change is a ________ change
   a) Permanent  
   b) Temporary  
   c) Chemical  
   d) Physical  (A)

16. S.I. system is derived from French word_______.
   a) Simple international  
   b) System international  
   c) Straight international  
   d) None of these  (B)

19. The unit of volume in S.I. system is_______.
   a) Cubic meter  
   b) Kilometer  
   c) Liter  
   d) Meter  (A)

23. The “a.m.u” is the abbreviation of ________.
   a) Atomic molecule unit  
   b) Atomic mass unit  
   c) Unit of mass  
   d) None of these  (B)

26. The force with which earth attracts a body towards its center, is called ________ of the object.
   a) mass  
   b) temperature  
   c) weight  
   d) none of these  (C)

28. The weight of the body at the center of earth will be _________.
   a) two times  
   b) zero  
   c) four times  
   d) five times  (B)

29. The unit of mass is _________.
   a) kilogram  
   b) Newton  
   c) joule  
   d) None of these  (A)

30. The unit for weight is__________.
   a) Newton  
   b) joule  
   c) kilometer  
   d) None of these  (A)
33. The process to calculate the coldness or hotness of a body, is called_________.
a) isotope b) temperature c) melting point d) boiling point B

34. There are _________ measuring scale of temperature.
a) three b) two c) four d) five A

35. The boiling point of water in Fahrenheit scale is __________.
a) 312° F b) 216° F c) 212° F d) 314° F C

36. The boiling point of water in Kelvin scale is __________.
a) 373K b) 213K c) 313K d) 413K A

37. The exponential notation is the method to express different numbers in ________ from.
a) different b) same c) exponent d) numbers C

38. We can write 860000 in exponent from as__________.
a) 8.6 × 10^5 b) 8.6 × 10^4 c) 86 × 10^5 d) 6.8 × 10^5 A

39. The numbers which are less than one have exponents.
a) positive b) null c) negative d) none of these C

40. When we use the method of exponential notation then the chance of error ________
a) Increase b) Decreases c) Null d) Zero B

41. When we drop of last digit of a data then data is called ________ off a data
a) Significant b) Rounding c) Positive d) Figure B

42. The difference between calculated result and true answer is called
a) precision b) Accuracy c) error d) result C

43. An atom or group of atoms that carries an electrical charge is called
a) ion b) radical c) valency d) chemical formula A

44. The combining capacity of an element with other elements is called its
a) radical b) valency c) ion d) element B

45. The molecular formula represents the actual number of atoms in a __________.
a) ion b) molecule c) combination d) actual B

46. The molecular weight of H₂O= ____________.
a) 18 a.m.u. b) 20 a.m.u. c) 34 a.m.u. d) 44 a.m.u A

47. The formula weight of NaCl=__________.
a) 14.5 a.m.u. b) 54.1 a.m.u. c) 58.5 a.m.u. d) 85.5 a.m.u C

48. The formula weight of H₂O=__________.
a) 18 a.m.u. b) 16 a.m.u. c) 24 a.m.u. d) 42 a.m.u A
64. The formula weight of NaOH = _____________.
   a) 5 a.m.u
   b) 40 a.m.u
   c) analysis
   d) none of these

65. Molecular weight and atomic weight expressed in grams is called _____________.
   a) mole
   b) ion
   c) sodium
   d) molecules

66. According to law of conservation of mass, mass can neither be created nor ______ in a chemical reaction.
   a) mole
   b) destroyed
   c) reactant
   d) balance

67. The reactant producing small yield, is called ______ reactant.
   a) producing
   b) equation
   c) limiting
   d) none of these

68. Reactants which proceed only in one direction are called ______ reaction.
   a) limiting
   b) irreversible
   c) reversible
   d) complete

69. Reactants which proceed in both the directions are called ______ reaction.
   a) reverse
   b) reversible
   c) mole
   d) actual

70. CaCO\(_3\) = _____________.
   a) CaO + CO\(_2\)
   b) Ca\(_2\)O + O\(_2\)
   c) Ca + CO\(_2\)
   d) Ca + CO

71. AgNO\(_3\) + NaCl → _____________.
   a) AgCl + NaNO\(_3\)
   b) AgCl\(_2\) + NaNO\(_2\)
   c) Ag + NaCl
   d) AgCl\(_2\) + Na

01. According to modern concept all ordinary matter is composed of extremely tiny entities called.
   a) molecules
   b) compounds
   c) atoms
   d) elements

02. The atoms consist of all still smaller particles, the most important of which are.
   a) neutrons
   b) protons
   c) electrons
   d) all the three

05. The basic unit of length in SI system is.
   a) foot
   b) inch
   c) mile
   d) meter

06. The basic unit of mass in SI system is.
   a) kilogram
   b) pound
   c) gram
   d) milligram

08. A decimeter is equal to.
   a) 10\(^{-3}\) m
   b) 10\(^{-2}\) m
   c) 10\(^{-1}\) m
   d) none of these

12. The atomic mass unit is define as.
   a) \(\frac{1}{12}\) mass of C-12
   b) \(\frac{1}{10}\) the mass of C-12
   c) \(\frac{1}{12}\) the mass of C-13
   d) none of these

13. The standard carbon is called.
   a) C-13
   b) C-14
   c) C-12
   d) C-11

17. While multiplying the exponentially expressed the numbers, their exponents are.
   a) subtracted
   b) multiplied
   c) added
   d) none of these
18. Very small and very large quantities are expressed in terms of .
   a) significant figure  
   b) exponential notation  
   c) logarithm  
   d) none of these  
   B

19. 80635 is also written in exponential form as.
   a) $8.0635 \times 10^4$  
   b) $0.80635 \times 10^{-2}$  
   c) $8.0635 \times 10^4$  
   d) $8.0635 \times 10^{-4}$  
   C

20. 49.86 can be round off as.
   a) 49.8  
   b) 49.5  
   c) 49.84  
   d) 49.9  
   D

21. 45.000 has.
   a) two significant figure  
   b) four significant figure  
   c) five significant figure  
   d) none of these  
   B

22. The numbers which indicate confidence in measurement is called.
   a) precision  
   b) accuracy  
   c) significant figure  
   d) none of these  
   C

23. A combination of two or more atoms that can exist independently as a separateable distinguishable unit is called.
   a) atom  
   b) molecule  
   c) ion  
   d) none of these  
   B

24. A chemical formula based on actual, molecule is called.
   a) structural formula  
   b) empirical formula  
   c) molecular formula  
   d) none of these  
   C

25. Sum of the atomic weights of elements in a molecule is called.
   a) atomic weight  
   b) formula weight  
   c) empirical formula  
   d) none of these  
   B

26. The empirical formula of benzene is.
   a) $C_6H_6$  
   b) $C_6H_6$  
   c) CH  
   d) $C_6H_6$  
   C

27. Which compound has no molecular formula.
   a) NaCl  
   b) $N_2$  
   c) $Cl_2$  
   d) $HNO_3$  
   A

28. Mass of an object is a measure of .
   a) matter  
   b) inertia  
   c) weight  
   d) gravity  
   B

29. 1 mole of $H_2SO_4$ is.
   a) 49.0g  
   b) 98.02g  
   c) 100g  
   d) 50g  
   B

30. The symbolic representation of compound is called.
   a) formula  
   b) symbol  
   c) equation  
   d) none of these  
   A

31. 1 mole of carbon consists of $6.022 \times 10^{23}$ atom and weighs.
   a) 14.00g  
   b) 13.00g  
   c) 12.00g  
   d) 11.00g  
   C

32. The branch of chemistry which deals with the study of relationship between the quantities of reactants and products in a chemical reaction is called.
   a) stereochemistry  
   b) thermo chemistry  
   c) stiochiometry  
   d) photo chemistry  
   C
40. The actual yield is less than the theoretical yield, because of.
   a) side reaction
   b) mechanical loss
   c) reversible nature of the reaction
   d) all these factors

41. The amount of products obtained from the balanced chemical equation is regarded as.
   a) theoretical yield
   b) % yield
   c) actual yield
   d) none of these

44. 0.00034 has
   a) Five significant figures
   b) Four significant figures
   c) Three significant figures
   d) Two significant figures

45. Water is basically a
   a) Compound
   b) Element
   c) Mixture
   d) Solution

47. Mass of one atom of carbon is
   a) $2 \times 10^{23}$ g
   b) $1.99 \times 10^{-23}$ g
   c) $1.60 \times 10^{-24}$ g
   d) $1.60 \times 10^{-23}$ g

49. One gram of matter on complete conversion gives energy
   a) $9 \times 10^{-13}$ J.
   b) $9 \times 10^{13}$ J
   c) $9 \times 10^{-14}$ J
   d) $9 \times 10^{16}$ J

51. An organic compound has molecular weight 180 and empirical formula CH$_2$O. Its molecular formula may be
   a) C$_2$H$_6$O$_4$
   b) C$_2$H$_6$O$_{12}$
   c) C$_4$H$_{12}$O$_4$
   d) C$_6$H$_{12}$O$_6$

52. One mole each of sodium and potassium contains
   a) Equal atoms
   b) Equal volumes
   c) Equal masses
   d) None of these

53. The value of Avogadro's number is
   a) $6.022 \times 10^{23}$
   b) $6.01 \times 10^{24}$
   c) $6.022 \times 10^{24}$
   d) $6.01 \times 10^{-24}$

54. The simplest whole number ratio of atoms in the compound is called
   a) Molecular formula
   b) Structural formula
   c) empirical formula
   d) Dash formula

55. The number of significant figures in 0.0086 is
   a) One
   b) Three
   c) Four
   d) Two

59. CH$_4$ contains hydrogen by weight
   a) 20%
   b) 25%
   c) 30%
   d) 50%

60. Which is the element in the following?
   a) Water
   b) Steel
   c) Air
   d) Copper

61. The relation between $C^0$ and $F^0$ scales is
   a) $C^0 = \frac{5}{9} (F^0 - 32)$
   b) $C^0 = \frac{9}{5} (F^0 - 32)$
   c) $C^0 = \frac{9}{5} (F^0 + 32)$
   d) $C^0 = \frac{4}{9} (F^0 + 32)$
63. 1 mole of water contains molecules  
   a) 18  
   b) 9.022 x 10^{-22}  
   c) 60.022 x 10^{24}  
   d) 6.022 x 10^{23}  
   
64. The formula of aluminum sulphate is  
   a) AISO_4  
   b) AI_2SO_4  
   c) AI_2(SO_4)_3  
   d) AI(SO_4)_3  
   
65. What is the mass of 1.5 mole of oxygen molecules?  
   a) 16 g  
   b) 48 g  
   c) 32 g  
   d) 8 g  
   
66. The branch of chemistry which deals with the study of nucleus structure and properties is known as  
   a) Physical chemistry  
   b) Inorganic chemistry  
   c) Radiation chemistry  
   d) Nuclear chemistry  
   
67. Atoms that have the same atomic number but different mass numbers are called  
   a) Isotones  
   b) Isobars  
   c) Isotopes  
   d) Isomers  
   
68. Atoms that have the same mass number but different atomic numbers are called  
   a) Isotones  
   b) Isobars  
   c) Isotopes  
   d) Isomers  
   
72. The % age of an O in 1 mole of CuSO_4 is:  
   a) 30.10%  
   b) 40.10%  
   c) 20.10%  
   d) 10.10%  
   
73. 0.206g of an organic compound containing C, H and O was subjected to combustion analysis. The amount of CO_2 produced is 0.494g. The % of C in the compound is  
   a) 44.44%  
   b) 63.44%  
   c) 65.44%  
   d) 66.44%  
   
74. How many moles of sulphur are present in 15.0g of the element?  
   a) 0.364  
   b) 0.467  
   c) 0.164  
   d) 2.304  
   
75. 1 mole of OH ions consists of 6.02 x10^{23} ions of hydroxyl group and weighs  
   a) 1 g  
   b) 16 g  
   c) 17 g  
   d) None of these  
   
76. 1 mole of water contains molecules of water:  
   a) 6.02 x10^{23}  
   b) 6.02 x10^{24}  
   c) 18  
   d) 16  
   
77. How many atoms of S are present in 0.467 moles of the element?  
   a) 6.022 x 10^{23}  
   b) 2.81 x 10^{23}  
   c) 6.022 x 10^{23}  
   d) None of these  
   
78. How many individual calcium atoms are there in 20g of the metal  
   a) 6.022 x 10^{23}  
   b) 3.01 x 10^{23}  
   c) 4.01 x 10^{23}  
   d) 12.04 x 10^{23}  
   
79. The number of moles of water result from burning 5 moles of oxygen in an excess of H_2 is:  
   a) 5 moles  
   b) 10 moles  
   c) 15 moles  
   d) 20 moles  
   
80. Consider the reaction 2KOH + H_2SO_4 ————> K_2SO_4 + 2H_2 How many moles of K_2SO_4 are produced from 28.0g of KOH?  
   a) 5  
   b) 0.25  
   c) 2.5  
   d) 2.5
Chapter 1
INTRODUCTION TO FUNDAMENTAL CONCEPTS OF CHEMISTRY

81. A compound was found to contain 40.01% C, 6.67% H and 53.32% O. The empirical formula of the compound is
   a) CHO         b) C₂H₂O         c) CH₂O         d) CHO₂
   C

82. A compound was found to contain 88.80% Cu and 11.20% O. The formula of the compound is
   a) CuO         b) CuO₂         c) Cu₂O         d) Cu₂O₂
   C

83. The formula which represents the simplest ratio of atom is:
   a) Molecular formula        b) Structural formula
   c) Empirical formula        d) Chemical formula
   C

84. The empirical formula of a compound is CH₂. Its molecular weight is 42. Its molecular formula is
   a) CH₂         b) C₂H₂         c) C₃H₆         d) C₆H₁₂
   C

85. The percentage of Ag in AgCl is:
   a) 50%         b) 65%         c) 75.2%        d) 28%
   C

86. The percentage of Ca in CaCO₃ is:
   a) 20%         b) 40%         c) 60%         d) 80%
   B

87. The mass of 6.022 x 10²³ molecules of CO:
   a) 17.01 g     b) 16.0 g     c) 28.01 g     d) 50.02 g
   C

88. Avogadro’s number of helium atom weigh
   a) 1.00 g     b) 4.00 g     c) 8.00 g     d) 4.0 x 6.22 x 10²³
   B

89. The weight of 22.4 litre of any gas at S.T.P. represents:
   a) Gram atomic weight        b) Gram molecular weight
   c) Gram equivalent weight     d) Molecular weight
   B

90. An unbalanced chemical equation is against the law of:
   a) Gaseous volume        b) Constant proportion
   c) Conservation of mass   d) Multiple proportion
   C

91. Which of the following contain more number of molecules ?
   a) 4 gm H₂         b) 10 gm CaCO₃
   c) 40 gm NaOH      d) 8 gm O₂
   A

92. The number of oxygen atoms present is 60 gms of glucose is:
   a) 0.5 Nₐ        b) 1 Nₐ
   c) 3/2 Nₐ        d) 2 Nₐ
   D

93. Under the same condition of temperature and pressure, 16 gm of oxygen gas (O₂) contains the same number of particles as:
   a) 20 gm of He gas        b) 22 gm of CO₂ gas
   c) 40 gm of NaOH          d) 71 gm of Cl₂ gas
   B

94. How many moles are there in 8 gm of the Hydrogen gas?
   a) 1 mole         b) 2 moles
   c) 4 moles        d) 8 moles
   C

95. Which of the following contains the same number of atoms as 12 g of Magnesium?
   a) 12 g of carbon    b) 20 g of calcium
   c) 24 g of carbon    d) 12 g of sodium
   B
11. The number of atoms present in 3 gms of carbon are:
   a) $15.05 \times 10^{23}$
   b) $1.505 \times 10^{23}$
   c) $6.02 \times 10^{23}$
   d) $3.01 \times 10^{23}$

12. The volume occupied by $3.01 \times 10^{23}$ molecules of ammonia at S.T.P. is:
   a) 22.4 lit
   b) 5.6 lit
   c) 11.2 lit
   d) 5.4 lit

13. Weight of single molecule of carbon dioxide is:
   a) 44 g
   b) $7.305 \times 10^{-23}$ g
   c) $6.02 \times 10^{24}$ g
   d) $4.184 \times 10^{-22}$ g

14. “Gases react in the ratio of small whole number by volume under similar condition of temperature and pressure”. It is the:
   a) Law of combining volume
   b) Law of mass action
   c) Law of Reciprocal proportions
   d) Charle’s law

18. A mole is the amount of the substance that contains, as there are atoms in exactly:
   a) 0.012 kg of carbon atom
   b) 12 a.m.u of hydrogen atom
   c) 1 gm of oxygen atom
   d) All of these

19. Calculate the percentage of oxygen in heavy water:
   a) 80%
   b) 60%
   c) 50%
   d) 20%

20. The molecular formula of a compound represents:
   a) The composition of the molecule of the compound
   b) The number of various kinds of atoms in a molecule of a compound
   c) The total number of atoms in a molecule of a compound
   d) All of the above

22. The empirical formula of a compound is $C_3H_6O$. It its molecular weight is 110, the molecular formula of compound is:
   a) $C_3H_6O_2$
   b) $C_3H_6O_2$
   c) $CHO$
   d) $C_6H_6O_2$

25. What is the volume of $O_2$ obtained at S.T.P. when 24.52 gms of $KClO_3$ are strongly heated?
   a) 1.12 litres
   b) 11.24 litres
   c) 2.24 litres
   d) 6.72 litres

26. The volume occupied by 1.4 gm of $N_2$ at S.T.P. is:
   a) $2.24 \, dm^3$
   b) $22.4 \, dm^3$
   c) $11.2 \, dm^3$
   d) $1.12 \, dm^3$

28. 15 litres of hydrogen combine with nitrogen to produce ammonia. The volume of ammonia in litre formed is:
   a) 10 litres
   b) 5 litres
   c) 8 litres
   d) 12 litres

29. How many litres of oxygen at S.T.P. are required for combustion of 4 gm of ethylene:
   a) 96 litres
   b) 9.6 litres
   c) 44.8 litres
   d) 67.2 litres

31. How many molecules of water are there in 36.0 g of $H_2O$?
   a) $6.02 \times 10^{23}$ molecules
   b) $3.01 \times 10^{23}$ molecules
   c) $1.20 \times 10^{24}$ molecules
   d) $1.13 \times 10^{24}$ molecules

32. The number of oxygen atoms in 300g of $CaCO_3$ is:
   a) $5.42 \times 10^{24}$ O atoms
   b) $6.02 \times 10^{23}$ O atoms
   c) $6.02 \times 10^{24}$ O atoms
   d) $3.01 \times 10^{23}$ O atoms

33. How many hydrogen atoms are present in 0.235g of $NH_3$?
   A) $6.02 \times 10^{22}$ H atoms
   b) $2.49 \times 10^{22}$ H atoms
   c) $2.49 \times 10^{22}$ H atoms
   d) $3.01 \times 10^{23}$ H atoms
34. The standard used for all atomic, molecular and formula weight of atom, molecule and formula unit respectively is:
   a) $^{14}\text{C}$  
   b) $^1\text{H}$  
   c) $^{12}\text{C}$  
   d) $^{16}\text{O}$  
   C

37. The weight of one molecule of $\text{CH}_3\text{OH}$:
   a) 32.0 gm  
   b) $5.32 \times 10^{-23}$ g  
   c) $6.02 \times 10^{23}$ g  
   d) $6.02 \times 10^{-23}$ g  
   B

39. An oxide of nitrogen contains 30.4% nitrogen. Its empirical formula is:
   a) $\text{NO}_2$  
   b) $\text{N}_2\text{O}$  
   c) $\text{NO}$  
   d) NO$_3$  
   A

51. When 40°C convert into Kelvin scale its value is:
   a) 273 K  
   b) 303 K  
   c) 313 K  
   d) 295 K  
   C

52. When 220 K converts into Celsius scale, its value is:
   a) 225°C  
   b) 53°C  
   c) -53°C  
   d) -212°C  
   C

54. Temperature of 300 K is equal in Celsius scale of:
   a) 25°C  
   b) 27°C  
   c) 48°C  
   d) 32°C  
   B

55. The empirical formula of glucose is:
   a) $\text{C}_6\text{H}_{12}\text{O}_6$  
   b) $\text{C}_3\text{H}_6\text{O}_3$  
   c) $\text{CH}_2\text{O}$  
   d) $\text{CHO}$  
   C

60. The empirical formula of sulphuric acid is:
   a) $\text{HSO}$  
   b) $\text{HSO}_4$  
   c) $\text{H}_2\text{SO}_4$  
   d) $\text{H}_2\text{SO}_2$  
   C

58. Modern system of measurement is.
   a) MKS system  
   b) Cus system  
   c) SI system  
   d) Fbs system  
   C

18. One gram is equal to.
   a) .01kg  
   b) .001kg  
   c) .0001kg  
   d) none of above  
   B

19. A substance in which all atoms are chemically identical having same atomic number is called.
   a) element  
   b) compound  
   c) matter  
   d) mixture  
   A

20. A substance of definite composition of weight consists of atoms of two or more different elements is called.
   a) element  
   b) compound  
   c) mixture  
   d) none of above  
   B

21. A substance consists of two or more pure substance not chemically combined with each other is.
   a) compound  
   b) mixture  
   c) element  
   d) none of above  
   B

26. A change in which chemical composition of substance does not change.
   a) temporary change  
   b) physical change  
   c) chemical change  
   d) none of above  
   B

27. Which is a physical change.
   a) burning of candle  
   b) burning of coal  
   c) burning of wood  
   d) none of above  
   A

28. The change in which making and breaking of bonds are involved is called.
   a) structural change  
   b) chemical change  
   c) physical change  
   d) none of above  
   B
31. The formula which gives the actual number of atoms of element in a molecule is called.  
   a) molecular formula  
   b) empirical formula  
   c) unit formula  
   d) none of above  
   Answer: A

32. Formula of sodium phosphate. 
   a) Na₃PO₂  
   b) Na₃PO₄  
   c) Na₂PO₂  
   d) Na₂PO₄  
   Answer: B

33. The formula of magnesium nitrate is. 
   a) MgNO₃  
   b) Mg(NO₃)₂  
   c) Mg₂(NO₃)₂  
   d) Mg₂NO₃  
   Answer: B

34. Formula of ferric oxide. 
   a) FeO  
   b) Fe₂O₃  
   c) Fe₃O₂  
   d) none of above  
   Answer: B

35. Formula of phosphoric acid. 
   a) H₃PO₃  
   b) H₃PO₄  
   c) H₂PO₄  
   d) H₃(PO₄)₃  
   Answer: B

37. The \( \frac{1}{12} \) part of mass of carbon is called. 
   a) 1kg  
   b) 1a.m.u  
   c) 1g  
   d) none of above  
   Answer: B

39. The sum of atomic masses of all atoms present in a molecule is called. 
   a) molecular mass  
   b) empirical mass  
   c) gram-molecular mass  
   d) none of the above  
   Answer: A

40. Atomic mass of an element is expressed in gms is called. 
   a) gram atomic mass  
   b) gram molecular mass  
   c) gram molecule  
   d) atomic mass unit  
   Answer: A

42. The numbers of atoms, ions or molecules in one mole of substance is equal. 
   a) \( 6.02 \times 10^{23} \)  
   b) \( 6.023 \times 10^{-21} \)  
   c) \( 6.02 \times 10^{26} \)  
   d) \( 6.02 \times 10^{13} \)  
   Answer: A

43. The numbers of atoms in one mole of hydrogen. 
   a) \( 6.02 \times 10^{23} \)  
   b) \( 6.023 \times 10^{-21} \)  
   c) \( 6.02 \times 10^{20} \)  
   d) \( 6.02 \times 10^{-19} \)  
   Answer: A

44. The numbers of moles per 8gms of NaOH are. 
   a) 2 moles  
   b) 0.2moles  
   c) .02moles  
   d) .002moles  
   Answer: B

45. The percentage of an element in compounds is as. 
   a) \( \frac{\text{Atomic mass of compound}}{\text{Atomic mass of compound}} \times 100 \)  
   b) \( \frac{\text{Atomic mass of element}}{\text{Formula mass of compound}} \times 100 \)  
   c) \( \frac{\text{Atomic mass of element}}{\text{Formula mass of element}} \times 100 \)  
   d) None of the above  
   Answer: B

50. In exponential notations 1000 is written as. 
   a) \( 1 \times 10^7 \)  
   b) \( 1 \times 10^6 \)  
   c) \( 1 \times 10^5 \)  
   d) \( 1 \times 10^2 \)  
   Answer: A

52. The number of significant figures in .023 is 
   a) 1  
   b) 2  
   c) 3  
   d) 0  
   Answer: B

54. .08000 has _________ significant figures. 
   a) 1  
   b) 2  
   c) 3  
   d) 4  
   Answer: A
55. Express the decimal equivalent of 1/60 to three significant figure.
   a) .0156 b) .01666 c) .0166 d) $1.7 \times 10^{-2}$
   Answer: C

56. The combination of two or more atoms that can exist independently as separate distinguishable unit is called.
   a) atom b) molecule c) formula unit d) ion
   Answer: B

58. Sum of the average atomic weight of elements in a molecule is called.
   a) atomic weight b) formula weight c) empirical formula d) none of above
   Answer: B

61. The number of atoms, ions or molecules in one mole of a substance is called.
   a) gram atom b) gram mole c) Avagadro’s number d) gram ions
   Answer: C

62. Quantity containing Avagadro’s number of atoms ions or molecules is called.
   a) mole b) gram molecule c) atomic mass d) atomic weight
   Answer: A

63. 14 grams of N₂ contains.
   a) $6.02 \times 10^{23}$ atoms b) $6.02 \times 10^{22}$ atoms c) $6.02 \times 10^{24}$ atoms d) $6.02 \times 10^{20}$ atoms
   Answer: A

64. The branch of chemistry which deals with quantities relationship between amounts of reactants and products on basis of balanced chemical equation is called.
   a) physical chemistry b) flame photometry c) stoichiometry d) none of above
   Answer: C

68. Gram atomic and gram molecular masses are referred as.
   a) mole mass b) mole c) mass number d) mole per gram
   Answer: B

10. Any thing which occupies space and has some weight is called
   a) Matter b) Energy c) Material d) None of these
   Answer: A

19. A change which involves breaking or making of new bonds is called
   a) Chemical change b) Ordinary change c) Permanent change d) Physical change
   Answer: A

21. One mole of H₂SO₄ is equal to
   a) 50g b) 100g c) 98g d) 99g
   Answer: C

28. The atomic weight of sodium is
   a) 27 amu b) 30 amu c) 23 amu d) 25 amu
   Answer: C

31. In a neutral atom, the number of protons are equal to the number of
   a) Neutrons b) Electrons c) Photons d) None of the above
   Answer: B

32. The atomic number of calcium is
   a) 19 b) 21 c) 20 d) 25
   Answer: C

33. The quantity of a product calculated stoichiometrically in a chemical reaction is called
   a) Actual yield b) Theoretical yield c) Negative yield d) None of the above
   Answer: B
34. The negative charged particles are called
   a) Cation  b) Radical  c) Anion  d) None of the above
   C

53. The percentage of Ca in CaCO₃ is
   a) 10  b) 20  c) 40  d) 80
   C

56. Which one of the following has two significant figures?
   I) 0.034  II) 0.0034  III) 0.00034
   a) I only  b) II only  c) III only  d) I, II and III
   D

57. The number 70345 can be written as
   a) 7.0345 x 10⁴  b) 70345 x 10²  c) 703.45 x 10³  d) 7034.5 x 10²
   A

61. The atomic mass of oxygen is 16 amu. The number of atoms in 16g of oxygen atom will be
   a) 2 x 6.023 x 10²³  b) 6.023 x 10²³  c) 16 x 6.023 x 10²³  d) 32 x 6.023 x 10²³
   B

66. The percentage of nitrogen by mass in HNO₃ is
   a) 34.6  b) 31.5  c) 22.2  d) 12.3
   C

2. The branch of science which deals with the study of composition, structure, properties of matter, changes in matter, energy changes is called
   a) Biology  d) Physics  c) Physical chemistry  d) Chemistry
   D

14. The number of molecules of Hydrogen obtained from the decomposition of 1 molecule of water is
   a) 1  b) 2  c) 3  d) 4
   A

15. The number of atoms in a molecule of oxygen is
   a) 2  b) 3  c) 4  d) 5
   A

29. The number of molecule present in 0.5 moles of nitrogen gas is
   a) 6.02 x 10²³  b) 2.06 x 10²  c) 3.01 x 10¹²  d) 3.01 x 10²³
   D

33. Which of following is molecule
   a) He  b) Ag  c) N  d) O
   A

40. Which one of the following is the correctly balanced equation for the reaction between iron and Chlorine to form iron-chloride
   a) Fe + 3Cl₂ → 2 FeCl₃  b) Fe + 3Cl₂ → FeCl₃  c) 2Fe + 3Cl₂ → 2 FeCl₃  d) Fe + Cl₂ → FeCl₃
   C

45. The SI unit of temperature is
   a) Kelvin  b) Celsius  c) Fahrenheit  d) Centigrade
   A

46. Boiling point of water
   a) 212 °F  b) 373 K  c) 100°C  d) all of the above
   D

47. Freezing point of water
   a) 32°F  b) 273 K  c) 0°C  d) all of the above
   D
48. Normal temperature of the body of human being
   a) 37°C  
   b) 98.6°F  
   c) 310 K  
   d) all of the above  
   Answer: D

49. Force exerted by gas molecules on unit area is known as
   a) stress  
   b) weight  
   c) Force  
   d) Pressure  
   Answer: D

50. What is the mass of 1.5 mole of oxygen molecules?
   a) 16 g  
   b) 24 g  
   c) 32 g  
   d) 48 g  
   Answer: D
01. A substance which is hard, rigid and has definite volume and shape is called ________.
   a) Solid
   b) Liquid
   c) Gas
   d) Molecule
   A

02. A substance which have no definite shape but definite volume, is called ________.
   a) Solid
   b) Liquid
   c) Gas
   d) Definite
   B

04. In gases, the molecules occur at very ________ distance.
   a) Close
   b) Widely
   c) Definite
   d) Gas
   B

05. The gases have ________ definite shape
   a) Very
   b) So
   c) No
   d) Substance
   C

06. The solids have ________ shape.
   a) Definite
   b) Very
   c) Shape
   d) Container
   A

10. If we increases pressure then we can ________ gases easily.
    a) Compress
    b) Column
    c) Change
    d) Measure
    A

11. When compressed gases are suddenly allowed to expand, they cause cooling and this phenomenon is called ________ effect.
    a) Compressed
    b) Atmosphere
    c) Joule-Thomson
    d) Joule-Maxwell
    C

12. In refrigerators, ________ effect is used.
    a) Joule-Thomson
    b) Individual
    c) Original
    d) Barometer
    A

13. All gases ________ on heating and contract on cooling.
    a) Cold
    b) Expand
    c) Independent
    d) Original
    B

14. In gases, the kinetic energy of molecules increases with ________ of temperature.
    a) Decreases
    b) Null
    c) Increase
    d) Balance
    C

15. At constant pressure the volumes of gas ________ by increasing temperature.
    a) Increases
    b) Decreases
    c) Effuse
    d) Pressure
    A

16. The force exerted by gas molecules per unit area per second is called ________.
    a) Gas volume
    b) Gas pressure
    c) Gas temperature
    d) None of these
    B

17. The formula for pressure of a gas is ________.
    a) \( P = \frac{F}{A} \)
    b) \( P = \frac{A}{F} \)
    c) \( P = FA \)
    d) None of these
    A

19. 1 atmosphere = ________ mm Hg.
    a) 670
    b) 760
    c) 607
    d) 706
    B

20. Calculate – 22°F to Kelvin Scale?
    a) 213
    b) 233
    c) 223
    d) 243
    D
21. Calculate $60^\circ\text{C}$ to Kelvin scale?
   a) $343\text{ K}$                   b) $43\text{ K}$
   c) $333\text{ K}$                   d) $34\text{ K}$  
      C
22. The lowest possible value at which molecular motion ceases is called _________.
   a) Absolute zero                   b) Boyle’s law
   c) Constant                        d) None of these  
      A
23. According to Boyle’s law,”At constant temperature the volume of a given mass of gas is _______ proportional to the pressure of gas”.
   a) Inversely                       b) Directly
   c) Volume                          d) Verification  
      A
24. The mathematical form of Boyle’s law is _________.
   a) $PV = R$                         b) $PV = \text{constant}$
   c) $\frac{P}{V} = R$                d) $PR = C$  
      B
25. Charle’s law was introduced in ___________.
   a) 1787                            b) 1708
   c) 1807                            d) 2000  
      A
26. According to Charle’s law,”At constant pressure, the volume of a given mass of gas is _______ proportional to the temperature of gas.”
   a) Inversely                       b) Directly
   c) Constant                        d) None of these  
      B
27. The mathematical form of Charle’s law is _________.
   a) $PV = \text{constant}$               b) $\frac{V}{T} = K$
   c) $\frac{V}{K} = T$                 d) $VT = K$  
      B
28. The general gas equation is _________.
   a) $PV = RT$                         b) $P = RT$
   c) $V = RT$                         d) $\frac{P}{V} = R$  
      A
29. The general gas equation for “n” number of molecules is _________.
   a) $nPV = RT$                       b) $PV = nRT$
   c) $\frac{P}{V} = R$                d) None of these  
      B
30. The formula to find the value of “R” is _________.
   a) $R = \frac{PV}{nT}$              b) $R = \frac{nT}{PV}$
   c) $R = \frac{P}{nT}$              d) $R = \frac{V}{nT}$  
      A
31. The gas which deals all the laws of gases is called _______ gas.
   a) Density                        b) Volume
   c) Ideal                          d) Same  
      C
32. The gas which do not obey all the laws of gases, called _________ gas.
   a) Non-ideal                      b) Temperature
   c) Volume                         d) Equal  
      A
33. The gases which have lighter molecular masses _________ more readily.
   a) Non-ideal                      b) Same
   c) Diffuse                        d) Effuse  
      C
CHEMISTRY-XI

Chapter 2

THE THREE STATES OF MATTER (Part 1: GASES)

36. According to Graham’s law, “The rate of diffusion of two gases is ________ proportional to the square roots of their densities or molecular weights at the same pressure and temperature.”
   a) Inversely 
   b) Directly 
   c) Diffusion 
   d) Effusion 

37. According to Graham’s law, “The rate of effusion of two gases is ________ proportional to the square roots of their densities or molecular weights at the same temperature and pressure.”
   a) Inversely 
   b) Directly 
   c) Diffuse 
   d) Effuse 

38. At S.T.P. 1 mole of gas = __________
   a) 27.4 dm$^3$ 
   b) 22.4 dm$^3$ 
   c) 42.4 dm$^3$ 
   d) 37.4 dm$^3$

39. The value of Avogadro’s constant is __________.
   a) $1.694 \times 10^{-11}$ 
   b) $61.4 \times 10^{-23}$ 
   c) $6.022 \times 10^{23}$ 
   d) $60.22 \times 10^{-25}$

40. The collection of some postulates which explains the behaviour of ideal gases is called the _______ theory of gases
   a) Molecular 
   b) Potential 
   c) Average 
   d) Kinetic

41. The collision which deals without any gain or loss of energy is called _______ collision.
   a) Elastic 
   b) Potential 
   c) Kinetic 
   d) Directly

89. Matter exists in forms
   a) Three 
   b) Two 
   c) One 
   d) Four

90. Matter having no definite shape and volume is called
   a) Liquid 
   b) Plasma 
   c) Solid 
   d) Gas

92. Gases possess.
   a) Indefinite volume 
   b) Indefinite shape 
   c) Miscibility 
   d) All the three

95. The force exerted by 76 cm long column of Hg on an area of 1 cm$^2$ at 0°C is called
   a) Total pressure 
   b) Standard pressure 
   c) Partial pressure 
   d) None of these

96. Atmospheric pressure is measured by
   a) Nanometer 
   b) Barometer 
   c) Thermometer 
   d) Ammeter

97. The scale in which freezing point of water is taken as 32° and boiling point of water as 212° is called
   a) Normal scale 
   b) Fahrenheit scale 
   c) absolute scale 
   d) Celsius scale

98. One atmosphere is equal to
   a) 76 torr 
   b) 760 torr 
   c) 7.6 torr 
   d) 7600 torr

100. Normal body temperature is
   a) 37°C 
   b) 310K 
   c) 98.6°F 
   d) All these are correct
101. At constant temperature, volume of given mass of a gas is inversely proportional to pressure on it. This is a statement of
   a) Charles law
   b) Boyle’s law
   c) Hooks law
   d) Grahams law

103. The volume of a fixed mass of a gas is directly proportional to the absolute temperature, at constant pressure. This is a statement of
   a) Boyle’s law
   b) Charle’s law
   c) Avogadro’s law
   d) Dalton’s law

104. According to Charles law the volume of a given mass of gas should be zero at
   a) 25°C
   b) 100°C
   c) -273°C
   d) 273°C

105. Which value is designated as absolute zero or zero of the kelvin scale?
   a) -273.15°C
   b) -173.15°C
   c) 273°C
   d) None of these

106. Which variables are interrelated in ideal gas equation?
   a) Volume
   b) Temperature
   c) Pressure
   d) All these

107. The value of R depends on
   a) Temperature
   b) Pressure
   c) Volume
   d) All these

113. The rate of diffusion of two gases are inversely proportional to the square roots of their densities or molecular weights, is a statement of
   a) Charle’s law
   b) Boyle’s law
   c) Graham’s law
   d) Dalton’s law

114. The pressure of each gas in a mixture is called
   a) Total pressure
   b) Vapour pressure
   c) equilibrium pressure
   d) Partial pressure

115. The total pressure exerted by a mixture of gases is the sum of the partial pressure of all the gases present, is a statement of
   a) Charle’s law
   b) Boyle’s law
   c) Dalton’s law
   d) Graham’s law

116. The percentage of N₂ in the air is
   a) 78.08%
   b) 80%
   c) 90%
   d) 65%

117. Equal volume of all gases at the same temperature and pressure contain equal number of molecules. This is a statement of
   a) Charle’s law
   b) Dalton’s law
   c) Graham’s law
   d) Avogadro’s law

118. 1 mole of an ideal gas at S.T.P occupies a volume of
   a) 22.4 dm³
   b) 2.24 dm³
   c) .224 dm³
   d) 224 dm³

119. 1 mole of CO₂ contains molecules
   a) 6 x 10^{24}
   b) 6.022 x 10^{23}
   c) 6.022 x 10^{24}
   d) 6.022 x 10^{25}

120. \( \frac{r_1}{r_2} = \sqrt{\frac{M_2}{M_1}} \) is the mathematical form of
   a) Charles law
   b) Grahams law
   c) Daltons law
   d) None of these

123. At the same temperature, the molecules of every gas have the same average
   a) Potential energy
   b) Rotational energy
   c) Vibration energy
   d) Kinetic energy
124. At high temperatures, the kinetic energy of the molecules is very large and the attractive forces become
   a) Small  b) Large  c) Zero  d) Negligible  

125. Which gas diffuses more rapidly?
   a) O₂  b) SO₃  c) NH₃  d) H₂  

126. The ratio of diffusion of the H₂ and O₂ is
   a) 1 : 4  b) 4 : 1  c) 1 : 8  d) 1 : 16  

127. STP means
   a) 298 K and 1 atm  b) 25°C and 1 atm  c) 0°C and 1 atm  d) 25°C and 25 atm  

128. Mathematically Charles law is written as
   a) V ∝ 1/T  b) V ∝ P  c) V ∝ T  d) P ∝ T  

129. Which pair of gases behave more ideally at room temperature and pressure?
   a) N₂, NH₃  b) Cl₂, Br₂  c) H₂, O₂  d) He, H₂  

130. Gas molecules exert pressure on the walls of container because of
   a) Attraction  b) Repulsion  c) Cohesion  d) Collision  

133. The volume of fixed mass of a gas is directly proportional to the absolute temperature at constant pressure. This is a statement of
   a) Avogadro’s law  b) Dalton’s law  c) Boyle’s law  d) Charle’s law  

136. Which of the following exists in gaseous form?
   a) O₃  b) HF  c) Ne  d) All of these  

137. 1 torr is equal to
   a) 2 mm Hg  b) 1 mm Hg  c) 100 mm Hg  d) 1000 mm Hg  

138. Which of the following is used in Barometer?
   a) liquid NH₃  b) Cl₂ gas  c) mercury  d) water  

139. PV = K is a statement of
   a) Charles law  b) Newton’s law  c) Boyles law  d) Avogadroes law  

140. 373.15 K temperature is equal to
   a) 0°C  b) 200°C  c) 1°C  d) 100°C  

143. The average kinetic energy of a molecule is given by
   a) \( \frac{1}{2} mv^2 \)  b) \( \frac{3}{2} mv^2 \)  c) \( \frac{5}{2} mv^2 \)  d) \( \frac{1}{2} m^2v^2 \)  

144. The average distance traveled by a molecule between two successive collisions is called
   a) collision diameter  b) collision frequency  c) mean free path  d) free path
CHEMISTRY-XI

Chapter 2

THE THREE STATES OF MATTER (Part 1: GASES)

145. The intermolecular attractive forces operative over very short distances in gases are
   a) H-bonding
   b) ionic bonding
   c) Van der Waals forces
   d) none of these
   Answer: C

146. For a given mass of a gas, if temperature increases
   a) Pressure and volume remain constant
   b) Volume increase provided pressure is constant
   c) Pressure decreases provided volume is constant
   d) Volume decreases provided pressure is constant
   Answer: B

147. For a given mass of a gas at constant temperature, if volume V becomes three times more, then pressure P will become
   a) 3P
   b) P / 3
   c) 3P / T
   d) 9P^2
   Answer: B

148. For a given mass of gas, if the pressure is reduced to half and temperature is doubled, then volume V will be
   a) 4V
   b) 2V
   c) V / 4
   d) 8V
   Answer: A

149. Which of the following is not a correct postulate of the kinetic theory of gases?
   a) The gas molecules are in random motion
   b) The collision between the molecules are perfectly elastic
   c) The average kinetic energies of different gases are equal at a particular temperature
   d) The pressure exerted on the walls of the container is due to intermolecular forces
   Answer: D

151. According to the kinetic theory of gases, the average kinetic energy
   a) Is proportional to temperature
   b) Decreases with rise in temperature
   c) Is always constant for a particular gas
   d) Is zero at 0°C
   Answer: A

160. A gas diffuses 1/5 times as fast as hydrogen. Its molecular weight is
   a) 50
   b) 25
   c) 25 \sqrt{2}
   d) 50 \sqrt{2}
   Answer: A

161. The rate of diffusion of SO_2 and O_2 are in the ratio:
   a) 1 : \sqrt{2}
   b) 1 : 32
   c) 1 : \sqrt{32}
   d) 1 : 4
   Answer: A
02. The property in which recovery of shape takes place when deforming force is removed is called
   a) Hardness
   b) Elasticity
   c) Cleavage
   d) None of the above
   B

03. The process in which solid is directly converted into gaseous state is called
   a) Evaporation
   b) Boiling
   c) Sublimation
   d) None of the above
   C

04. A single substance that crystallizes into two or more different forms under different conditions is called
   a) Ploymorphous
   b) Isomorphous
   c) allotrope
   d) None of the above
   A

08. Pressure cooker works on the principles that with the increase in pressure the boiling point of a liquid
   a) Decreases
   b) Increases
   c) Remains constant
   d) None of the above
   B

09. The force of attraction between particles of liquid are called
   a) Cohesive forces
   b) Adhesive forces
   c) Surface tension
   d) None of the above
   A

11. Name the substance which belongs to hexagonal category of crystallographic
   a) Tin
   b) Graphite
   c) Copper sulphate
   d) Sodium Nitrate
   B

12. Sodium chloride crystal belongs to which category of crystallographic system
   a) Rhombic
   b) Monoclinic
   c) Cubic
   d) Hexagonal
   C

13. A crystal can have
   a) Plane of symmetry
   b) Axis of symmetry
   c) Centre of symmetry
   d) All of the above
   D

14. The Venderwaals forces depend upon
   a) The number of electrons present in a molecule
   b) Molecular size
   c) The shape of the molecule
   d) All of the above
   D

21. With increasing molecular size the viscosity of liquid
   a) Increases
   b) Decreases
   c) Does not change
   A

22. Water has maximum density at
   a) 337K
   b) 277K
   c) 177K
   d) 137K
   B

23. Poise is the unit of
   a) Surface tension
   b) Density
   c) Viscosity
   d) None of the above
   C

25. The internal resistance of a liquid is called
   a) Viscosity
   b) Surface tension
   c) Capillary action
   d) None of the above
   A

27. The process in which a solid is directly converted into the gaseous state is called
   a) Evaporation
   b) Sublimation
   c) Adhesion
   d) Condensation
   B

28. If an element is found in more than one physical forms, the property is called
   a) Isomorphism
   b) Symmetry
   c) Allotropy
   d) None of the above
   C
30. The lengths of a unit cell along x, y and z axis are represented by
   a) a,b,c
   b) d,e,c
   c) c,d,e
   d) a,b,e
   Answer: A

33. What is called the process in which a gas is liquefied directly on cooling?
   a) Evaporation
   b) Condensation
   c) Sublimation
   d) None of the above
   Answer: B

34. Electron sea is a cloud of
   a) Electrons
   b) Photons
   c) Protons
   d) Neutrons
   Answer: A

35. The crystal systems are of
   a) 7 types
   b) 10 types
   c) 5 types
   d) 8 types
   Answer: A

36. Good conductors of electricity are
   a) Molecular crystals
   b) Metallic crystals
   c) Covalent crystals
   d) all of the above
   Answer: B

37. Mercury does not wet the glass because of
   a) Repulsion
   b) Cohesion
   c) Surface tension
   d) None of the above
   Answer: B

38. What is called the rising of liquid in a capillary tube?
   a) Capillary action
   b) Enthalpy
   c) Ascent
   d) None of the above
   Answer: A

39. Name the quantity of heat required to melt one mole of solid
   a) Heat of fusion
   b) Heat of sublimation
   c) Heat of vaporization
   d) None of the above
   Answer: A

40. Viscosity is measured by
   a) Thermometer
   b) Viscometer
   c) Barometer
   d) None of the above
   Answer: B

41. What is called the system in which all the axes are equal in lengths and at, right angle to each other
   a) Tetragonal system
   b) Cubic system
   c) Trigonal system
   d) Hexagonal system
   Answer: B

42. In which system all three axes and angles are unequal
   a) Triclinic system
   b) Hexagonal system
   c) Tetragonal system
   d) Trigonal system
   Answer: A

44. The structure of graphite is called
   a) Trigonal
   b) Hexagonal
   c) Octahedral
   d) Tetragonal
   Answer: B

45. A drop of water spreads over blotting paper because of
   a) Intermolecular forces
   b) Capillary action
   c) Repulsion of molecules
   d) Surface tension
   Answer: B

46. Evaporation occurs at
   a) High temperature
   b) Low temperature
   c) All temperature
   d) absolute temperature
   Answer: C

47. Evaporation is accelerated by
   a) Cooling
   b) Heating
   c) Adding more liquid
   d) Removing liquid
   Answer: B

49. The compound that has zero dipole moment is
   a) HCl
   b) H₂S
   c) PH₃
   d) CH₄
   Answer: D
51. The vapour pressure of water is maximum at
   a) 80°C  b) 32°F  c) 313K  d) 50°C  
   Answer: A

57. Glycerin boils at 290°C under normal atmospheric pressure. If the pressure is reduced to 50mm of Hg, it will boil
   a) Above the given temperature  b) Below the given temperature  
   c) At the same temperature  d) At 25°C  
   Answer: B

62. Which one of the following compounds has a sharp melting point?
   a) Pure C₆H₁₂O₆  b) Impure HCl  
   c) Mixture of the above two  d) Glass  
   Answer: A

66. One gram of ice needs 80 calories of heat to change into water at 0°C. How much heat will be required to change 100g of ice at 0°C?
   a) 0.8 Kcal  b) 8.0 Kcal  c) 80 Kcal  d) 800 Kcal  
   Answer: B

68. Which of the following factors has no effect on boiling point?
   a) Impurities in the liquid  b) Amount of liquid  
   c) Intermolecular forces  d) Pressure  
   Answer: D

71. The vapour pressure of water is maximum at
   a) 48°C  b) 335°C  c) 32°F  d) 80°C  
   Answer: D

165. The state of matter which possesses definite volume but no definite shape is called.
   a) liquid  b) solid  c) plasma  d) gas  
   Answer: A

166. All the gases converted into liquid and solids by
   a) cooling  b) compression  c) evaporation  d) cooling and compression  
   Answer: D

171. Dipole-dipole forces are present between.
   a) polar molecules  b) non-polar molecules  c) bent molecules  d) none of these  
   Answer: A

174. Which molecule is hydrogen bonding?
   a) SiH₄  b) HCl  c) H₂O  d) CHCl₃  
   Answer: C

175. The amount of heat required to vaporize one mole of liquid at its boiling point without change in temperature is called.
   a) molar heat of vaporization  b) molar heat of sublimation  c) molar heat of fusion  d) none of these  
   Answer: A

176. The pressure exerted by the vapours in equilibrium with its pure liquid at given temperature is called.
   a) equilibrium pressure  b) atmospheric pressure  c) vapour pressure  d) external pressure  
   Answer: C

178. The vapour pressure of water increase with temperature and at the boiling point becomes equal to.
   a) 760cm  b) 760mm  c) 76mm  d) All of these  
   Answer: B

179. What factors affect the vapour pressure?
   a) temperature  b) nature of liquid  c) intermolecular forces  d) all these  
   Answer: D

181. The temperature at which the vapour pressure of a liquid becomes equal to the atmospheric pressure is called.
   a) freezing point  b) boiling point  c) mixing point  d) critical temperature  
   Answer: B
CHEMISTRY-XI

THE THREE STATES OF MATTER (Part 2: LIQUIDS AND SOLIDS)

183. At higher altitudes, water boils at temperatures.
   a) 100°C  b) more than 100°C  c) less than 100°C  d) none of these
   C

193. Stalagometer is a device which is used to measure.
   a) surface tension  b) viscosity  c) vapour pressure  d) refractive index
   A

194. The resistance of liquid to its flow is called.
   a) surface tension  b) viscosity  c) refraction  d) none of these
   B

195. Which substance has high viscosity
   a) water  b) ether  c) benzene  d) honey
   D

196. Viscosity of liquid depends on.
   a) molecular size  b) molecular shape  c) H-bonding  d) all of these
   D

197. The viscosity of H₂O is more than CH₃OH due to.
   a) covalent bond  b) ionic bond  c) H-bonding  d) none of these
   C

207. The system in which all the three axes are equal length and are at right angle to each other is called.
   a) hexagonal  b) trigonal  c) cubic  d) rectangular
   C

208. The system in which all the three axes are unequal and are at right angle to each other is called.
   a) cubic  b) hexagonal  c) orthorhombic  d) tetragonal
   C

209. The system in which all the three axes and angles are unequal is called.
   a) hexagonal  b) monoclinic  c) tetragonal  d) triclinic
   D

210. The system in which two out of three axes are of equal and angles are of 90° is called.
   a) cubic system  b) hexagonal system  c) trigonal system  d) tetragonal system
   D

211. The crystals in which the metal atoms join together through metallic bond are called.
   a) ionic crystal  b) covalent crystal  c) metallic crystal  d) molecular crystal
   C

212. The crystals which are formed by interaction between positively and negatively charged ions are known as.
   a) metallic crystal  b) covalent crystal  c) ionic crystal  d) none of these
   C

214. Silicon crystals is an example of.
   a) ionic crystal  b) covalent crystal  c) metallic crystal  d) none of these
   B

215. Metallic crystal is good conductors of.
   a) heat  b) electricity  c) both heat and electricity  d) none of these
   C

220. Evaporation causes.
   a) freezing  b) cooling  c) heating  d) sublimation
   B

223. Which substance has more surface tension?
   a) water  b) mercury  c) ethanol  d) benzene
   B
224. Isomorphic substance have same.  
   a) boiling point  
   b) melting point  
   c) atomic ratio  
   d) lattice point  

226. Viscosity is measured by.  
   a) barometer  
   b) spectrometer  
   c) viscometer  
   d) stalagometer  

231. Which of the following liquid has higher boiling point?  
   a) HCl  
   b) HBr  
   c) H₂O  
   d) Br₂
254. Universe is made up of.
   a) Matter  
   b) Space  
   c) Energy  
   d) All of three
   
255. Conduction of electricity through any gas may be studied at any value of.
   a) High pressure  
   b) Low pressure  
   c) Moderate pressure  
   d) None of these
   
256. Cathode rays emitted from cathode are.
   a) Canal rays  
   b) Protons  
   c) Electrons  
   d) Positrons
   
257. Charge to mass ratio (e/m) of the electron is determined by.
   a) R.A. Millikan  
   b) J.J. Thompson  
   c) G.J. Stoney  
   d) None of these
   
258. The beam attracted towards the negatively charged plate is.
   a) Alpha particles  
   b) Neutron  
   c) Beta particles  
   d) Gamma particles
   
259. Which rays carry no charge and nonmaterial in nature?
   a) Alpha  
   b) Beta  
   c) Gamma  
   d) None of these
   
   a) Positive charge  
   b) Negative charge  
   c) No charge  
   d) None of these
   
261. Rutherford bombarded thin gold foil with
   a) Beta particles  
   b) Neutron  
   c) Alpha particles  
   d) Electron
   
262. The nucleus is surrounded by a number of electrons equal to the number of
   a) Proton  
   b) Neutron  
   c) Negatron  
   d) Positron
   
263. According to Rutherford’s model, the nucleus is surrounded by
   a) Proton  
   b) Neutron  
   c) Positron  
   d) Electron
   
264. The neutron particle:
   a) has a mass of 1 gm  
   b) has a mass approx. equal to that of proton  
   c) has a charge equal to that of electron  
   d) has negligible mass
   
265. The 2P_x, 2P_y and 2P_z orbital of an atom have identical shape but differ in their:
   a) size  
   b) orientation  
   c) shape  
   d) none of these
   
266. Number of protons, neutrons and electrons respectively present in Sodium are:
   a) 11, 11, 12  
   b) 11, 12, 12  
   c) 12, 11, 11  
   d) 11, 12, 11
   
267. Which of the following light waves has the highest energy?
   a) Ultraviolet radiation  
   b) Infrared radiation  
   c) Visible light  
   d) X-rays
07. How many orbital exist with principal quantum number 3?
   a) 2 b) 9 c) 3 d) 4

10. Among the following, the electron with the highest energy is:
   a) \( n = 3, l = 2, m = 0, s = \pm \frac{1}{2} \)
   b) \( n = 4, l = 0, m = 0, s = \pm \frac{1}{2} \)
   c) \( n = 4, l = 0, m = 1, s = \pm \frac{1}{2} \)
   d) \( n = 3, l = 0, m = 0, s = \pm \frac{1}{2} \)

11. The particles present in anode rays are:
   a) Positively charged particles
   b) Electrons
   c) alpha particles
   d) Beta particles

13. How many neutrons are present in the \( { }_{92}^{238}U \)?
   a) 92 b) 238 c) 146 d) 330

14. When an atom changes into a cation, its:
   a) Mass number decreases
   b) Atomic number increases
   c) Size increases
   d) Size decreases

17. The quantum numbers of 2P electron are:
   a) \( n = 2, l = 1 \)
   b) \( n = 2, l = 0 \)
   c) \( n = 2, l = 3 \)
   d) \( n = 2, l = 2 \)

18. The number of nucleons present in the heaviest isotope of hydrogen:
   a) 1 b) 2 c) 4 d) 3

19. Rutherford’s scattering experiment demonstrated:
   a) The existence of x-rays
   b) The existence of \( \alpha \)-particles
   c) The nuclear model of atom
   d) The mass to charge ratio of electron

20. Shape of p-orbital is:
   a) Spherical
   b) Double dumbbell
   c) Complicated
   d) Dumb bell

21. Angular momentum of an electron revolving in an orbit is equal to:
   a) \( \frac{nh}{2\pi} \)
   b) \( \frac{n}{h/2\pi} \)
   c) \( nh \times 2\pi \)
   d) \( 2\pi/nh \)

22. The number of electrons that could be accommodated in a ’d’ orbital
   a) 6 b) 2 c) 14 d) 10

23. The electrical charge that is present on an electron in coulombs:
   a) \( 1.602 \times 10^{-19} \)
   b) \(-1.602\times 10^{-19} \)
   c) \( 1.602 \times 10^{19} \)
   d) \(-1.602 \times 10^{19} \)

24. Weight of an electron in kilogram is:
   a) \( 9.1 \times 10^{31} \)
   b) \( 9.1 \times 10^{31} \)
   c) \( 0.91 \times 10^{31} \)
   d) \( 0.91 \times 10^{-31} \)

26. X-rays are produced when cathode rays strike on:
   a) Graphite
   b) Carbon
   c) Metal
   d) Non-metal

27. The number of electrons that can be accommodated in the orbit of Azimuthal quantum number \( l = 1 \).
   a) 2 b) 6 c) 10 d) 14

28. When an electron moves from an inner orbit to a higher orbit, energy is:
   a) Emitted
   b) Absorbed
   c) No change in energy d) None of the above
29. Maximum number of electrons that can be present in n = 3 principal quantum number:
   a) 18
   b) 32
   c) 8
   d) 16
   A

30. Radius of an anion formed when compared with the radius of the atom is:
   a) Equal
   b) Smaller
   c) Greater
   d) None of the these
   C

31. Most penetrating radioactive rays are:
   a) Cathode rays
   b) \(\alpha\)-rays
   c) \(\beta\)-rays
   d) \(\gamma\)-rays
   D

33. Bohr’s model of an atom is based on:
   a) Quantum theory
   b) Dalton’s atomic theory
   c) Law of mass action
   d) Law of conservation of matter
   A

34. The shape of ‘s’ orbital is:
   a) Tetrahedral
   b) Dumb-bell
   c) Spherical
   d) Pyramidal
   C

35. The Positron has a charge equal to that of:
   a) Proton
   b) \(\alpha\)-particle
   c) Neutron
   d) Electron
   A

36. Emission spectrum obtained when transition of electrons occurs from:
   a) n = 3 to n = 1
   b) n = 1 to n = 4
   c) n = 2 to n = 3
   d) n = 2 to n = 4
   A

37. In an atom, no two electrons will have same four quantum number value. The principle is:
   a) Pauli
   b) Hund’s
   c) Aufbau
   d) All of these
   A

38. Rutherford’s scattering experiment is related to the size of:
   a) Nucleus
   b) Atom
   c) Electron
   d) Neutron
   A

39. Which of the following relates photons both as ways are motion and a stream of particles:
   a) \(E = mc^2\)
   b) \(E = hv\)
   c) \(mv^2 = \frac{nh}{2\pi}\)
   d) All of these
   B

40. Which electronic level would allow the hydrogen atom to absorb a photon but not to emit a photon:
   a) 3s
   b) 2P
   c) 2s
   d) 1s
   D

42. Nitrogen is having three unpaired electrons. It is in according to:
   a) Hund’s rule
   b) Aufbau principle
   c) Pauli’s exclusion principle
   d) Heisenberg’s uncertainty principle
   A

43. The radius of the first Bohr’s orbit is:
   a) 5.29\(\times\)\(10^{-10}\)m
   b) 0.529\(\times\)\(10^{-10}\)m
   c) 52.92\(\times\)\(10^{-10}\)m
   d) 0.0529\(\times\)\(10^{-10}\)m
   B

48. The radius of 10\textsuperscript{th} Bohr’s orbit of hydrogen atom is:
   a) 52.9\(\times\)\(10^{-10}\)m
   b) 5.29\(\times\)\(10^{-10}\)m
   c) 0.529\(\times\)\(10^{-10}\)m
   d) None of the above
   A

50. When l = 2, the possible ‘m’ values are:
   a) -1, 0, +1
   b) -2, -1, 0, +1, +2
   c) 0 only
   d) -3, -2, 0, +1, +2, +3
   B

52. Isotope of hydrogen with radioactive property is:
   a) Protium
   b) deuterium
   c) Tritium
   d) Ortho hydrogen
   C
57. Uncharged particles among the following:
   a) $\alpha$-rays  
   b) $\beta$-rays  
   c) Cathode rays  
   d) $\gamma$-rays

58. The resultant particle obtained when a hydrogen nucleus accepts a neutron is:
   a) $\alpha$-particle  
   b) $\gamma$-rays  
   c) Deuterium  
   d) Tritium

58. The resultant particle obtained when a hydrogen nucleus accepts a neutron is:  
   a) $\alpha$-particle  
   b) $\gamma$-rays  
   c) Deuterium  
   d) Tritium

58. The resultant particle obtained when a hydrogen nucleus accepts a neutron is:  
   a) $\alpha$-particle  
   b) $\gamma$-rays  
   c) Deuterium  
   d) Tritium

58. The resultant particle obtained when a hydrogen nucleus accepts a neutron is:  
   a) $\alpha$-particle  
   b) $\gamma$-rays  
   c) Deuterium  
   d) Tritium
The element with their complete outermost shell, are called ________ elements
a) inert  b) reactive  c) valency  d) none of these

The element with their incomplete outermost shell, are called ________. elements
a) inert  b) reactive  c) repulsion  d) none of these

The valency of oxygen is__________.
 a) 6  b) 2  c) 4  d) 13

The valency of halogen is __________.
 a) one  b) five  c) three  d) six

The force with which atoms combine with each other, is called_________.
 a) valency  b) chemical bond  c) three  d) none of these

There are_______ main types of chemical bonds.
 a) four  b) three  c) two  d) five

The electrostatic attraction between positive and negative ions in an ionic compound is called an __________ bond.
 a) ionic  b) covalent  c) co-ordinate covalent bond  d) none of these

The ionic-bond is also called__________.
 a) co-ordinate covalent bond  b) electrovalent  c) covalent  d) none of these

The formation of “NaCl” is an example of__________.
 a) ionic bond  b) covalent  c) ionization energy  d) none of these

The formation of “MgO” is an example of_______ bond.
 a) covalent  b) ionic  c) atomic  d) none of these

In the formation of ionic bond, the number of electrons lost must be ________ to the number of electrons gained.
 a) equal  b) different  c) negative  d) covalent

The atom which loses electrons becomes __________.
 a) anion  b) cation  c) electron  d) none of these

The atom which gains electrons, becomes__________.
 a) electron  b) cation  c) anion  d) none of these

An element forming positive ion must have_______ ionization potential.
 a) low  b) great  c) small  d) none of these

The__________ energy is required to convert sodium to sodium positive ion .
 a) 496j  b) 469J/mole  c) 495 kJ/mole  d) 694k J/mole

When chlorine is converted in to chloride ion then __________ energy is released.
 a) -348 k J/mole  b) 439 k J/mole  c) 495 k J/mole  d) none of these
18. Ionic compounds are generally _________ at room temperature.
   a) liquid
   b) solid
   c) water
   d) none of these  
   17  B

20. The reaction of ionic compounds are very_________.
   a) fast
   b) slow
   c) equal
   d) covalent  
   18  A

22. The formation of hydrogen molecule (H₂) is an example of_________.
   a) covalent bond
   b) ionic bond
   c) hydrogen bond
   d) none of these  
   19  A

23. The atoms having electro negativity difference___________ 1.7 from covalent bond
   a) equal to
   b) same as
   c) less than
   d) greater than  
   20  C

24. There are __________ main types of covalent bond.
   a) four
   b) three
   c) five
   d) none of these  
   21  B

25. The covalent bond which is formed due to one electron pair, is called_________.
   a) double covalent bond
   b) triple covalent bond
   c) single covalent bond
   d) none of these  
   22  C

26. Oxygen (O₂) is the example of __________ covalent bond
   a) double covalent bond
   b) single covalent bond
   c) triple covalent bond
   d) none of these  
   23  A

27. Nitrogen (N₂) is the example of __________ covalent bond
   a) triple
   b) double
   c) single
   d) none of these  
   24  A

28. In molten state, the covalent compounds are __________ conductors of electricity.
   a) triple
   b) bad
   c) good
   d) none of these  
   25  B

29. Covalent compounds have __________ melting and boiling points.
   a) low
   b) high
   c) slow
   d) none of these  
   26  A

30. The energy required to break the bonds between one mole of hydrogen molecules into atoms is.
   a) 901 k J/mole
   b) 435 k J/mole
   c) 735 k J/mole
   d) 351 k J/mole  
   27  B

31. Oxygen (O₂) is a _________ molecule
   a) paramagnetic
   b) directional
   c) covalent solid
   d) atom  
   28  A

32. Polar molecule has__________ bond energy.
   a) less
   b) more
   c) equal
   d) none of these  
   29  B

33. The degree of polarity of molecule is called _____________.
   a) dipole moment
   b) covalent bond
   c) bond moment
   d) molecule moment  
   30  A

36. In methane, the bond pairs are arranged in_________ form.
   a) simple
   b) tetrahedral
   c) complex
   d) repulsion  
   31  B

37. There are__________ main types of overlapping in orbitals.
   a) four
   b) three
   c) five
   d) two  
   32  D
### CHEMICAL BONDING

38. Single bond is always ________ bond.
   a) overlap  
   b) sigma  
   c) partially  
   d) half  

40. How many sigma bonds can be predicted between two atoms?
   a) one  
   b) two  
   c) five  
   d) nine  

44. A process of mixing one “S” and one “P” orbital to form two equivalent “SP” hybrid orbitals, is called ____________.
   a) SP-hybridization  
   b) P-hybridization  
   c) S-hybridization  
   d) hybridization  

45. When central atom is SP$^3$ – hybridized then the bond angle is ____________.
   a) 109.5$^0$  
   b) 209.5$^0$  
   c) 107.5$^0$  
   d) 104.5$^0$  

388. A chemical bond which is formed by mutual sharing of electrons is called.
   a) Ionic bond  
   b) Covalent bond  
   c) Metallic bond  
   d) None of these  

389. Ionic compounds have high.
   a) m.p  
   b) b.p  
   c) m.p and b.p  
   d) None of these  

390. Ionic compounds are soluble in.
   a) benzene  
   b) Water  
   c) Chloroform  
   d) Hexane  

391. The crystals of ionic compounds are made up of.
   a) Atoms  
   b) Ions  
   c) Molecules  
   d) Compounds  

393. A covalent bond in which both the electrons are donated by one of the atoms called.
   a) Ionic bond  
   b) Covalent bond  
   c) Co-ordinate bond  
   d) None of these  

397. Which bond is non-directional in character?
   a) Covalent  
   b) Ionic  
   c) Coordinate  
   d) None of these  

399. The order of decreasing bond energies in hydrogen halides is.
   a) HCl> HF> HBr> HI  
   b) HBr> HI> HCl> HF  
   c) HF> HCl> HBr>HI  
   d) HI>HBr> HCl >HF  

400. Which compound has coordinate covalent bond?
   a) CH$_4$  
   b) NH$_3$  
   c) NH$_4^+$  
   d) SiH$_4$  

406. A bond in which region of highest electron density is around the bond axis is called.
   a) Pi-bond  
   b) Sigma bond  
   c) H-bond  
   d) None of these  

407. The bond which if formed due to parallel overlap of p-orbitals of two already bonded atoms is known as.
   a) Pi-bond  
   b) Sigma bond  
   c) Metallic bond  
   d) none of these  

408. The mixing of one s and three p-orbital results in the formation of.
   a) Sp$^3$ hybrids  
   b) Sp$^3$hybrids  
   c) Sp hybrids  
   d) Sp$^3d$ hybrids  

409. The geometry of NH$_3$ is.
   a) Linear  
   b) Octahedral  
   c) Angular  
   d) Pyramidal
CHEMICAL BONDING

411. Ethylene molecule has which hybridization.
   a) $\text{Sp}^3$  b) $\text{Sp}$  c) $\text{Sp}^2$  d) none of these
   
417. Which of the following is non-polar molecule?
   a) $\text{CH}_4$  b) $\text{H}_2\text{O}$  c) $\text{NH}_3$  d) $\text{H}_2\text{S}$

418. Which of the following is polar molecule?
   a) $\text{CH}_3\text{Cl}$  b) $\text{CCl}_4$  c) $\text{C}_2\text{H}_6$  d) $\text{C}_2\text{H}_4$

424. Which molecule has zero dipole moment?
   a) $\text{SO}_2$  b) $\text{H}_2\text{O}$  c) $\text{NH}_3$  d) $\text{CO}_2$

425. Oxygen atom in $\text{H}_2\text{O}$ shows hybridization.
   a) $\text{Sp}$  b) $\text{Sp}^2$  c) $\text{Sp}^3$  d) $\text{Sp}^2\text{d}$

435. Which of the following molecules has angular shape?
   a) $\text{H}_2\text{S}$  b) $\text{CO}_2$  c) $\text{CO}$  d) $\text{HF}$

439. Which compounds have fast reaction?
   a) Covalent compound  b) Ionic compound  c) Metallic compound  d) Coordinate compound

455. The number of bonds in a nitrogen molecules is
   a) One sigma and one Pi  b) One sigma and two Pi  c) Three sigma only  d) Three Pi only

456. An ionic compound $\text{A}^+\text{B}$ is most likely to be formed when
   a) The ionization energy of $\text{A}$ is higher and electron affinity of $\text{B}$ is low
   b) The ionization energy of $\text{A}$ is low and electron affinity of $\text{B}$ is high
   c) Both ionization energies of $\text{A}$ and electron affinity of $\text{B}$ are high
   d) Both ionization energy of $\text{A}$ and electron affinity of $\text{B}$ are low

02. Which of the compounds below has dipole moment zero?
   a) $\text{CH}_4$  b) $\text{NH}_3$  c) $\text{HF}$  d) $\text{H}_2\text{O}$

08. An example of a molecule containing co-ordinate covalent bond is:
   a) $\text{NH}_3$  b) $\text{NH}_4\text{Cl}$  c) $\text{NaCl}$  d) $\text{HF}$

09. The octet rule is not valid for the molecule:
   a) $\text{CO}_2$  b) $\text{H}_2$  c) $\text{O}_2$  d) $\text{CO}$

10. Among the following molecules that is linear is:
   a) $\text{CO}_2$  b) $\text{CH}_3\text{Cl}$  c) $\text{H}_2\text{O}$  d) $\text{BF}_3$

12. Total number of electrons that take part in forming bonds in $\text{N}_2$ is:
   a) 2  b) 4  c) 6  d) 8

14. Two H-atoms joined together by a covalent bond forming hydrogen molecule which have equal:
   a) electron affinity  b) electronegativity  c) both $\text{A}$ & $\text{B}$  d) none of the above

15. The shared pairs of electrons in a molecule are called:
   a) lone pairs  b) bonding pairs  c) non-bonding pairs  d) Pi electrons pairs
19. The electron pairs that say with one atom and are not shared are called:
   a) Lone pairs  
   b) Ionic bond pairs
   c) Bond pairs  
   d) Shared pairs

20. To determine the extent of polar character in a bond by the difference in:
   a) ionization potential  
   b) electron affinity
   c) electronegativity  
   d) ionic radius

21. The distance between the nuclei of two atoms joined by a covalent bond is called:
   a) bond length  
   b) bond order
   c) ionic radius  
   d) nuclear distance

24. Which group of elements in the periodic table is characterized by unreactive electronic configuration?
   a) First group  
   b) 2nd group
   c) 3rd group  
   d) Zero group

26. Which of the following sets of atoms are arranged in their order of increasing electronegativity:
   a) B < F < N  
   b) F < N < B
   c) B < N < F  
   d) F < B < N

28. Which of the molecule shows sp³ hybridization:
   a) CH₄  
   b) NH₃
   c) H₂O  
   d) All of these

29. 1 debye (D) is equal to:
   a) 3.34 x 10⁻²⁸ cm  
   b) 3.334 x 10⁻³⁸ cm
   c) 3.34 x 10⁻³⁰ cm  
   d) 4.184 x 10⁻³⁰ cm

30. Valence shell electron pair repulsion (VSEPR) theory is used to predict:
   a) the direction of reaction  
   b) molecular shape
   c) molecular size  
   d) the extent of reaction

32. Which is weakest among the following types of bonds:
   a) ionic bond  
   b) covalent bond
   c) hydrogen bond  
   d) vander waal’s forces

33. In which of the following is the angle between the two covalent bonds greatest?
   a) CO₂  
   b) CH₄
   c) NH₃  
   d) H₂O

34. The high boiling point of water is due to:
   a) weak dissociation of water molecules  
   b) it’s high dielectric constant
   c) it’s high specific heat  
   d) hydrogen bonding among water molecules

36. A particular element has the following electronic configuration : 1s²2s²2p⁵, in its chemical reactions, it is most likely to:
   a) loose 1 electron  
   b) lose 7 electrons
   c) gain 1 electron  
   d) lose 3 electrons

37. The type of bonding in hydrogen chloride is:
   a) ionic  
   b) polar covalent
   c) non-polar covalent  
   d) co-ordinate covalent

38. In diatomic molecule, in which atoms have identical electronegativities, sharing of the bonding electrons between the two atoms is:
   a) unequal sharing  
   b) equal sharing
   c) no sharing  
   d) none of the above

40. When sodium and chlorine react, energy is:
   a) absorbed and ionic bonds are formed  
   b) released and covalent bonds are formed
   c) absorbed and covalent bonds are formed  
   d) released and ionic bonds are formed
41. What type of hybridization would account that all bond angles in C₂H₄ and 120°.
   a) sp²
   b) sp³
   c) sp
   d) dsp³
   B

44. Which of the following compound is covalent:
   a) H₂
   b) KCl
   c) MgO
   d) NaCl
   A

45. In hybridization, the number of valence electrons in carbon atom is:
   a) 2
   b) 4
   c) 6
   d) 8
   B

46. Crystal of NaCl is formed by the arrangement of the particles:
   a) NaCl molecules
   b) Na and Cl atoms
   c) Na⁺ and Cl⁻ ions
   d) all of the above
   C

47. In the triple bond of acetylene, the following bonds are present:
   a) 1 sigma & 2 Pi bonds
   b) 2 sigma & 1 Pi bonds
   c) 3 sigma bonds
   d) 3 Pi bonds
   A

48. Dipole moment of CO₂ is zero. Hence the bond angle in CO₂ is:
   a) 109.5°
   b) 90°
   c) 180°
   d) 120°
   C

51. Which of the following has bond angle greater than 109.5°?
   a) CS₂
   b) H₂S
   c) NH₃
   d) CCl₄
   A

52. Which of the following has highest dipole moment?
   a) CHCl₃
   b) CO₂
   c) NH₃
   d) HF
   D

54. The C – C bond length in ethylene when compared with C – C bond length of acetylene it is:
   a) more
   b) less
   c) equal
   d) half
   A

57. The bond formed when Ammonia molecules add a proton to form ammonium ion is:
   a) covalent
   b) co-ordinate
   c) ionic
   d) none
   B

58. The state of hybridization of ‘B’ atom in boron trichloride is:
   a) sp¹
   b) sp²
   c) sp
   d) dsp³
   B

59. The bond formed in fluorine molecule is due to:
   a) s – s overlapping
   b) s – p overlapping
   c) p – p overlapping
   d) p – s overlapping
   C

60. Hybridization involves:
   a) bond pairs
   b) lone pairs
   c) both A & B
   d) none of these
   C

61. An element ‘A’ has electronic configuration 1s² 2s² 2p⁶ 3s¹ combines with element ‘B’ which has electronic configuration 1s² 2s² 2p⁶ 3s² 3p². The bond between ‘A’ and ‘B’ is:
   a) ionic
   b) covalent
   c) co-ordinate
   d) metallic
   A
ENERGETICS OF CHEMICAL REACTIONS

01. The energy that transfer from one object to another due to their difference in temperature, is
   called ________
   a) Heat
   b) Temperature
   c) covalent
   d) Energy
   A

02. The S.I. Unit of heat is ________
   a) Coulomb
   b) Joule
   c) Newton
   d) Kilometer
   B

03. 1 KJ = ________ J
   a) $10^6$
   b) $10^4$
   c) $10^3$
   d) $10^5$
   C

08. The equation shows ________ reaction.
    C + O$_2$ $\rightarrow$ CO$_2$, $\Delta H = -393.7$ KJ / mole.
    a) Endothermic
    b) Exothermic
    c) Null
    d) Salt
    B

09. The reactions, in which heat is absorbed from surrounding to system, are called ________
    reactions
    a) Null
    b) Salt
    c) Endothermic
    d) Exothermic
    C

10. The equation shows ________ reaction.
    C + O$_2$ $\rightarrow$ CO + H$_2$, $\Delta H = 131.4$ KJ / mole.
    a) endothermic
    b) Exothermic
    c) Chemical
    d) Content
    A

11. Heat of reaction is denoted by ________
    a) $\Delta K$
    b) $\Delta H$
    c) $\Delta R$
    d) $\Delta C$
    B

12. 1 Calorie = ________ Joules.
    a) 4.184
    b) 3.148
    c) 8.144
    d) 9.144
    A

15. “$\Delta H$” is ________ in exothermic reactions.
    a) Positive
    b) Negative
    c) Zero
    d) One
    B

16. “$\Delta H$” is ________ in endothermic reactions.
    a) Positive
    b) Negative
    c) Null
    d) Change
    A

17. Everything which is under experiment is called ________
    a) System
    b) Negative
    c) Positive
    d) Constant
    A

18. The things which are not a part of a system are called ________
    a) System
    b) Surroundings
    c) Bond energy
    d) Rate of reaction
    B

19. The state function is ________
    a) Volume
    b) Velocity
    c) Graphite
    d) None of these
    A

20. The internal energy of a molecule is the sum of ________ energy and potential energy.
    a) Pressure
    b) Temperature
    c) Kinetic
    d) None of these
    C

21. The branch of science which deals with energy transformation, called ________
    a) Thermodynamics
    b) Rate of reaction
    c) Constant
    d) Energy
    A
22. Energy can convert from one form to another, it can neither be created nor destroyed.  
   a) Second law of thermodynamics  
   b) First law of thermodynamics  
   c) Law of potential energy  
   d) None of these  
   B

27. According to “Hess’s” law  
   a) $\Delta H$ remains same  
   b) $\frac{\Delta H}{\Delta Q} = \text{Constant}$  
   c) “$\Delta H$” shows negative value  
   d) None of these  
   A

29. Hess’s law explains the__________ in heat of reaction.  
   a) Changes  
   b) Equal  
   c) Temperature  
   d) Joules  
   A

32. The description of a system in its surrounding is called  
   a) Condition  
   b) Law  
   c) State  
   d) All of the above  
   C

35. The standard heat of formation is  
   a) $\Delta H_f$  
   b) $\Delta H_f^0$  
   c) $\Delta H$  
   d) $\Delta E^0$  
   B

20. In endothermic reactions heat is  
   a) Released  
   b) Absorbed  
   c) Increased  
   d) Decreased  
   B

33. The $\Delta H$ for a reaction is – 110 Kcal/mole, which shows that the reaction is  
   a) Endothermic  
   b) Exothermic  
   c) Not stable  
   d) It needs catalyst  
   B

37. When $\Delta H$ for a reaction is a negative quantity the reaction is said to be  
   a) Reversible  
   b) At equilibrium  
   c) Exothermic  
   d) Endothermic  
   C
ENERGETICS OF CHEMICAL REACTIONS

40. For an exothermic reaction, the sign of enthalpy will be,
   a) Negative  b) Positive  c) Zero  d) None of these  A
41. The branch of chemistry which deals with thermal energy change in chemical reaction is called.
   a) Chemical kinetic  b) Thermodynamics  c) Thermo chemistry  d) Mechanics  C
42. If heat is evolved in reaction, the process is said to be.
   a) Endothermic  b) Exothermic  c) Isothermal  d) Adiabatic  B
43. If heat is absorbed in reaction, the process is said to be.
   a) Exothermic  b) Isothermal  c) Adiabatic  d) Endothermic  D
44. The branch of science which deals with energy transformations is known as.
   a) Thermo chemistry  b) Kinetics  c) Photo chemistry  d) Thermodynamics  D
45. The energy required to break one mole of bonds to form neutral atoms is called.
   a) Bond length  b) Bond strength  c) Bond energy  d) None of these  C
46. The amount of heat evolved or absorbed in a process is same whether the process takes place in one or several steps is the statement of.
   a) First law of thermodynamics  b) Hess’s law  c) Coulomb’s law  d) Phase law  B
47. The SI unit of pressure is.
   a) Atmosphere  b) Torr  c) Pascal  d) mm of Hg  C
48. Electrolytes which ionize to a very small extent in aqueous solution are known as.
   a) Strong electrolytes  b) Weak electrolytes  c) Moderate electrolytes  d) None of these  B
49. The rate of a chemical reaction is proportional to the product of molar concentrations of the reacting substance. This is a statement of.
   a) Law of multi proportional  b) Le-Chatelier’s principle  c) Law of mass action  d) Law of definite proportions  C
50. The oxidation number of free elements is.
   a) 1  b) 2  c) 0  d) 3  C
51. The lowest possible temperature at which molecular motion ceases in called.
   a) Absolute zero  b) 0°C  c) Freezing point  d) Boiling point  A
52. Concentration of reactants ___________ with the passage of time in chemical reactions.
   a) Increases  b) Decreases  c) Remains the same  d) None of the above  B
53. Equation showing both the mass and enthalpy reaction is known as.
   a) ideal equation  b) nerst equation  c) thermo chemical equation  d) Van der Waals equation  C
1. When rate of opposing reactions are equal then we say that chemical reaction is in ________
   a) Equilibrium  
   b) Stable  
   c) Change  
   d) None of these

2. The reactions which occur both in forward and reverse directions are called _______ reactions.
   a) Change  
   b) Reversible  
   c) Indirectly  
   d) Evaporation

3. The process of chemical equilibrium is true for ________ reactions.
   a) Reversible  
   b) Forward  
   c) Increase  
   d) Decrease

4. The law of mass action was introduced by Guldberg and ________ in 1869.
   a) Joule  
   b) Maxwell  
   c) Wage  
   d) None of these

5. The equilibrium constant “Kc” has ________ unit.
   a) No  
   b) One  
   c) Two  
   d) Three

6. A substance which completely ionizes in aqueous solution and gives us positive and negative ions, is called ________
   a) Strong electrolyte  
   b) Homogeneous solution  
   c) Weak electrolyte  
   d) None of these

7. A substance which partially ionizes in aqueous solution is called ________ electrolyte.
   a) Strong  
   b) Weak  
   c) Positively  
   d) None of these

8. H₂SO₄ is a ________ electrolyte.
   a) Strong  
   b) Weak  
   c) Substance  
   d) Reactant

9. The ionization is the process in which the electrolytes are ________ up into positive and negative ions.
   a) Change  
   b) Phase  
   c) Split  
   d) Equilibrium

10. When we increase the temperature then the rate of ________ reaction will decrease.
    a) Equal  
    b) Exothermic  
    c) Radical  
    d) None of these

11. “KOH” is a ________ electrolyte.
    a) Strong  
    b) Weak  
    c) Ion  
    d) Molecule

12. “HCN” is a ________ electrolyte.
    a) Weak  
    b) Strong  
    c) Positive  
    d) Aqueous

13. In chemical reaction CH₃ COOH + CH₃ OH ⇌ CH₃ COOCH₃ + H₂O the reaction mixture is always expected contain.
    a) All four substance  
    b) Only products  
    c) Only reactants  
    d) CH₃ COOH+CH₃+COOCH₃

14. Le-Chatelier’s principle is a generalization which enables us to produce the effect of change of.
    a) Pressure only  
    b) Pressure, temperature& concentration  
    c) temperature& concentration  
    d) Only temperature
09. For a system $3A + 2B \leftrightarrow C$ the equilibrium constant expression.
   a) $\frac{[A]^3[B]^2}{C}$  
   b) $\frac{C}{[A]^3[B]^2}$  
   c) $\frac{[A]^2[B]^3}{C}$  
   d) $\frac{[A]^3[B]^3}{C}$  

11. We can deduce the direction in which equilibrium will shift with the help of.
   a) Law of mass action  
   b) Law of heat of formation  
   c) Le-Chatelier’s principles  
   d) Hess’ law

19. Rate of exothermic reaction will decrease with increase in.
   a) Volume  
   b) Temperature  
   c) Pressure  
   d) None of the above

20. A stress in equilibrium system is.
   a) Favoured  
   b) opposed  
   c) Not opposed  
   d) None of the above

01. The equilibrium that involves reactant and product in a single phase is called
   a) Dynamic  
   b) Heterogenous  
   c) Homogenous  
   d) None of the above

02. $2SO_2 + O_2 \rightarrow 2SO_3$ in the reaction, when concentration of $SO_3$ is increased than concentration of $O_2$.
   a) Decreases  
   b) Increases  
   c) Remains constant  
   d) None of the above

03. Electrolyte which ionize to a very small extent in a solution called
   a) Weak electrolyte  
   b) Strong electrolyte  
   c) Neutral  
   d) None of the above

04. Reaction which proceed in the forward direction and go completion are called.
   a) Equilibrium reaction  
   b) Reversible reaction  
   c) Irreversible reaction  
   d) None of the above

06. When a weak electrolyte is dissolved in water only a small amount of molecule is
   a) Ionized  
   b) Remain same  
   c) Deionized  
   d) None of the above

08. Reaction which proceed on both side and never go to completion is called
   a) Reversible reaction  
   b) Equilibrium reaction  
   c) Irreversible reaction  
   d) None of the above

09. Equilibrium involving reactants and products in more than one phase is called
   a) Dynamic  
   b) Heterogenous  
   c) Homogenous  
   d) None of the above

10. $PCl_5 \overset{\text{?}}{\rightarrow} PCl_3 + Cl_2$ is a
    a) Reversible reaction  
    b) Irreversible reaction  
    c) Incomplete reaction  
    d) None of the above

14. According to law of mass action the rate of chemical reaction is proportional to which of the following
   a) Size of the container  
   b) Molar concentrations of the reactant  
   c) Nature of the reactants  
   d) All of the above

15. At equilibrium state the concentration of reactants and product are
   a) Constant  
   b) Different  
   c) Zero  
   d) None of the above
16. When a system loses some energy or does some work, then energy change ‘ΔE’ carries a
   a) Negative sign  
   b) Positive sign  
   c) Neutral sign  
   d) None of the above

18. The chemical equilibrium is the state of a reversible chemical reaction at which the rate of
    reverse reactions at the given conditions of temperature and pressure
   a) Equal  
   b) Less  
   c) More  
   d) All of the above

19. With the passage of time the rate of forward reaction
   a) Decreases  
   b) Increases  
   c) Remains constant  
   d) Decreases as well as increases

20. The “Equilibrium State” of the given chemical reaction reaches the rate of forward reaction
    becomes
   a) Equal to the rate of reversible reactions  
   b) Less to the rate of reversible reactions  
   c) More to the rate of reversible reactions  
   d) None of the above

21. The ‘Law of Mass Action’ was given in 1869 by
   a) Guildberg and Waage  
   b) Charle  
   c) Dalton  
   d) Millikan

22. The number of moles of a substance in one litre is called its
   a) Molar concentration  
   b) Active weight  
   c) Composition  
   d) None of the above

23. When the concentrations of substances are taken in molar units, then the equilibrium constant is
    represented by
   a) Kc  
   b) Kp  
   c) Kf  
   d) None of the above

24. Conventionally the concentrations of products are taken in the
   a) Numerator  
   b) Denominator  
   c) Both of these  
   d) None of these

25. Conventionally the concentrations of reactants are taken in the
   a) Denominator  
   b) Numerator  
   c) Both of these  
   d) None of these

28. The chemical mixture, when the rate of forward reaction becomes equal to the rate of reverse
    reaction is called
   a) Homogeneous mixture  
   b) Equilibrium mixture  
   c) Heterogeneous mixture  
   d) None of the above

29. The concentration of reactants and products are _______ at the state of equilibrium
   a) Variable  
   b) Constant  
   c) Variable as well as constant  
   d) Sometimes variable and sometimes constant

32. Molar concentration is called
   a) Weight  
   b) Active mass  
   c) Mass  
   d) None of the above

33. A substance that affects the rate of reaction but remains unchanged at the end of the reactions is
    called
   a) Catalyst  
   b) Electrolyte  
   c) Acid  
   d) None of the above

35. Reversible reactions are those which proceed in
   a) Forward direction  
   b) Backward direction  
   c) Both directions  
   d) None of the directions

36. A catalyst is added to a system to change
   a) The direction of the reaction  
   b) The rate of the direction  
   c) The concentration of the reaction  
   d) None of the directions
39. The $K_{sp}$ represents
   a) Solubility constant
   b) Equilibrium constant
   c) Ionization constant
   d) Dielectric constant

40. The unit of concentration is
   a) Mol ml$^{-1}$
   b) Mol lit$^{-1}$
   c) gm equivalent lit$^{-1}$
   d) g lit$^{-1}$

42. On heating a liquid at its dynamic equilibrium the concentration of molecules in vapor state as well as in liquid state
   a) Increases
   b) Decreases
   c) Remains constant
   d) Neither increases nor decreases

43. For the reaction $N_2O_4 \leftrightarrow 2NO_2$ before the equilibrium is reached, the ratio in change of concentration of $NO_2$ to the concentration of $N_2O_4$ is
   a) Equal
   b) Half
   c) Twice
   d) Four times

49. For a chemical reaction $N_2(g) + 3H_2(g) \leftrightarrow 2NH_3(g)$, the equilibrium $K_c$ will be represented by
   a) $[N_2][H_2]^3/[NH_3]^2$
   b) $[NH_3]^2/[H_2][N]$
   c) $[NH_3]^2/[N_2]/[H_2]^3$
   d) $[NH_3]^2/[N_2]/[H_2]$
CHEMICAL EQUILIBRIUM

544. Hydrogen lies in.
   a) 1st period
   b) 2nd period
   c) 3rd period
   d) 4th period

549. Le-Chatelier’s principle is concerned with.
   a) Catalysis
   b) Photolysis
   c) Photosynthesis
   d) Chemical equilibrium
### SOLUTIONS AND ELECTROLYTES

01. The solution is a ___________ mixture of two or more than two pure substances
   a) Homogeneous  
   b) Solute  
   c) Concentration  
   d) Dilute  

02. In solution, the large amount component is called ___________
   a) Homogeneous  
   b) Solvent  
   c) Solution  
   d) Composition  

03. The component of solution which is in lesser amount, is called ___________
   a) Homogeneous  
   b) Solvent  
   c) Solute  
   d) Composition  

05. Volume, ___________ or moles, are usually called concentration units
   a) Number  
   b) Weight  
   c) Percentage  
   d) Solvent  

07. The formula for molarity is ___________
   a) \( M = \frac{\text{number of moles of solute}}{\text{number of dm}^3 \text{ of solution}} \)  
   b) \( M = \frac{\text{number of dm}^3 \text{ of solution}}{\text{number of moles of solute}} \)  
   c) \( M = \frac{\text{wt of solute}}{\text{Eq wt of solute}} \)  
   d) None of these  

08. What weight of (NaOH) is required to prepare 0.01M solution in 750cm\(^3\)
   a) 40 g  
   b) 3 g  
   c) 30 g  
   d) 0.3 g  

09. What weight of NaOH is required to prepare 0.2 M solution in 750 cm\(^3\)
   a) 9 g  
   b) 6 g  
   c) 3 g  
   d) 5 g  

10. The equivalent weight of (NaH)O is ___________
    a) 90 g  
    b) 60 g  
    c) 40 g  
    d) 50 g  

11. What is the molarity of solution containing 45.0 g of glucose (C\(_6\)H\(_{12}\)O\(_6\)) in 400 mls of water
    a) 4.25 mol  
    b) 6.25 mol  
    c) 3.25 mol  
    d) 0.625  

12. The molal solution is the solution whose molality is ___________.
    a) Ten  
    b) Five  
    c) One  
    d) Four  

14. The process in which water molecules surround and interact with solute ions or molecules, is called ___________
    a) Hydration  
    b) Solvation  
    c) Product  
    d) Molecules  

15. The number of moles of a substance divided by total moles of all the substances, is called ___________
    a) Hydration  
    b) Solvation  
    c) Mole fraction  
    d) Component  

16. In the process of hydration, bond of water does not ___________
    a) Form  
    b) Break  
    c) Mix  
    d) Saturated  

17. We can say that CuSO\(_4\).5H\(_2\)O is a ___________
    a) Hydrate  
    b) Crystal  
    c) Ion  
    d) Molecule  

18. “Ksp” is called__________
a) Hydrate product  b) super product
c) Simple product  d) Solubility product  
   D

22. At given temperature, when maximum amount of solute dissolved in solution then it is called
   a) Saturated solution  b) Unsaturated solution
c) Super saturated solution  d) None of these  
   A

26. The negatively charged ionic substances are generally bigger have__________ ions
   a) Positive  b) Negative
c) Complex  d) Algebraic  
   A

27. Cations are also called__________ ions
   a) Negative  b) Positive
c) Complex  d) None of these  
   B

28. Anions are also called__________ ions
   a) Positive  b) Negative
c) Complex  d) None of these  
   B

30. The flow of electrons is called__________.
   a) Influence  b) Current
c) Ions  d) Molecules  
   B

31. The surfaces in a cell at which reaction takes place, are called__________
   a) Cathode  b) Anode
c) Electrodes  d) None of these  
   C

32. The positive electrode is called__________
   a) Anode  b) Cathode
c) Oxidation  d) Reduction  
   A

33. The negative electrode is called__________
   a) Cathode  b) Anode
c) Oxidation  d) Reduction  
   A

34. For a charge “Q”, the mathematically form for Faraday’s law is ________
   a) \( W \propto \frac{1}{Q} \)  b) \( W = ZQ \)
c) \( W = \frac{Z}{Q} \)  d) \( W = \frac{Q}{Z} \)  
   B

35. The electrolytic cell converts electrical energy into__________ energy.
   a) Physical  b) Influence
c) Chemical  d) Oxidation  
   C

39. The process in which oxygen removes, is called__________
   a) Reduction  b) Oxidation
c) Conductor  d) None of these  
   A

40. Which is the best definition of reduction reaction.
   a) Addition of hydrogen  b) Removal of oxygen
c) Gain of electrons  d) All are correct  
   D

41. The reactions in which reduction and oxidation both held, are called__________
   a) Redox reaction  b) Temperature
c) Reduction  d) Oxygen reaction  
   A
43. The “pH” of solution is defined as ________
   a) $\text{pH} = \frac{1}{[H^+]}
   \quad$ b) $\text{pH} = \frac{1}{[OH^-]}
   \quad$ c) $\text{pH} = \frac{1}{[-H^-]}
   \quad$ d) None of these

A

45. Methyl orange is a weak ________
   a) Base 
   b) Acid
   c) Neutral 
   d) Oxidation

A

03. Chemical reaction are frequently carried out in.
   a) Solvent 
   b) Solutions
   c) Solute 
   d) None of the above

B

04. The amount of solute present in given amount of solvent or solution is called.
   a) Molarity 
   b) Molality
   c) Saturation 
   d) Concentration

D

05. The number of moles of solute dissolved by one dm$^3$ of solution is called.
   a) Solubility 
   b) Molarity
   c) Normality 
   d) Molality

B

08. The most convenient way of expressing the concentration is.
   a) Molarity 
   b) Normality
   c) Mole fraction 
   d) Molality

A

14. The morality of solution containing 98g $\text{H}_2\text{SO}_4$ in sufficient water to make 500ml of solution.
   a) 0.5 
   b) 1
   c) 2 
   d) 3

C

16. The duster of ions with one more water ions is called.
   a) Hydrated ion 
   b) Unhydrated ion
   c) Common ion 
   d) Dehydrated ion

A

18. Positive ions are called.
   a) Cations 
   b) Anions
   c) Common ion 
   d) Hydrated

A

23. Which law or principles is used to predict weather precipitation will occur or not under given conditions.
   a) Law of mass action 
   b) Le-Chatelier’s principles
   c) Solubility product 
   d) None of the above

C

24. The process in which electric current is used to bring about a chemical change that otherwise do not takes place spontaneously.
   a) Conduction 
   b) Hydrolysis
   c) Salvation 
   d) Electrolysis

D

25. Cell which converts electrical energy to chemical energy.
   a) Electrolytic cells 
   b) Dry cells
   c) Voltaic cells 
   d) Down’s cells

A

28. The charge of atoms is called.
   a) Oxidation number 
   b) Atomic number
   c) Oxidation state 
   d) Mass number

A

32. In metal hydrides the oxidation number of hydrogen is taken as.
   a) 0 
   b) +1
   c) -1 
   d) None of the above

C

33. The value of ionic product of water at 25$^\circ\text{C}$.
   a) $10^{-7}$ 
   b) $10^{-14}$
   c) $10^7$ 
   d) $10^{+14}$

B
34. A solution containing hydrogen in concentration equal to $10^{-7}$M is said to be.
   a) Neutral  b) Acidic
   c) Basic   d) None of the above

36. The pH of 0.1 M acetic acid is.
   a) Less than one  b) Greater than one
   c) One   d) Seven

37. The addition of solid KCN to water would cause.
   a) Increase of pH  b) Decrease of pH
   c) No change of pH  d) No change in conductivity

47. Salts of strong acids and strong base are.
   a) Neutral  b) Acidic
   c) Alkaline  d) None of the above

48. The pH of human blood is.
   a) 7.4  b) 8.4
   c) 9.4  d) None of the above

52. Oxidation involves.
   a) Loss of electron  b) Gain of electron
   c) Increase in valency of negative part  d) Decrease in valency of positive part

54. If one mole of solute dissolved in one kg of solvent, the solution is called
   a) One molal  b) One molar
   c) One normal  d) None of the above

56. The difference of potential between two electrode which cause electric current to flow is called
   a) Cell reaction  b) Cell capacity
   c) Cell potential  d) None of the above

14. The logarithm of the reciprocal of the hydrogen ion concentration
   a) Standard scale  b) Arbitrary scale
   c) pH  d) None of the above

16. Oxidation means
   a) Addition of oxygen  b) Increase in positive valency
   c) Removal of hydrogen  d) All of the above
17. A substance which can accept electrons in known as
   a) Acid  b) Base  c) Oxidizing agent  d) Reducing agent  C

18. The sum of the oxidation number of all the atom in a neutral compound is
   a) Zero  b) one  c) Two  d) Three  A

20. Oxidation number of noble gases is taken to be
   a) +1  b) 0  c) -1  d) -2  B

24. Hydrogen oxygen bond is not broken in
   a) Hydrolysis  b) Hydration  c) Hydrogenation  d) Solvation  B

28. Oxidation number of Chromium in $K_2Cr_2O_7$ is
   a) +4  b) +6  c) +5  d) +8  B

30. Dilute hydrolic acid is a
   a) Strong acid  b) Weak acid  c) Conjugate acid  d) Basic acid  A

31. The ions which are attracted towards cathode during electrolysis are called
   a) Cations  b) anions  c) Hydroxy ions  d) none of the above  A

35. When $CH_3COONa$ is added to $CH_3COOH$ solution then the concentration of $H^+$ ion
   a) Decreases  b) Increase  c) Sometimes increases sometimes decreases  d) Remains same  A

38. If one mole of solute is dissolved in one liter of solution, the solution is called
   a) One molar  b) One molal  c) One normal  d) None of the above  A

42. The substance which is _______ during a chemical change is called reducing agent
   a) Oxidized  b) I onized  c) Reduced  d) None of the above  A

43. Electric current in a solution is carried by
   a) Ions  b) Molecules  c) Atoms  d) All of the above  A

45. What is the measure of electromotive force?
   a) Volts  b) Joule  c) Coulomb  d) None of these  A

46. The solution whose strength is known is called a/an
   a) Aqueous solution  b) Saturated solution  c) Original solution  d) Unsaturated solution  B

49. A solution which contains relatively a lesser amount of solute is called a
   a) Concentrated solution  b) Saturated solution  c) Dilute solution  d) Original solution  C

51. A solution of two component is called
   a) Binary solution  b) Dilute solution  c) Original solution  d) Standard solution  A

53. The number of moles of a solute per litre of the solution is called the _______ of the solution
   a) Molarity  b) Normality  c) Molality  d) None of the above  A
54. The number of moles of a solute per kg of the solvent is called
a) Normality  b) Molality  c) Molarity  d) None of the above  B

56. The combination or addition of water molecules to a substance with breaking any O-H bond is called
a) Hydration  b) Hydrolysis  c) Solute  d) None of the above  A

60. The acid-base reactions are usually
a) Reversible  b) Irreversible  c) Reversible as well as irreversible  d) None of the above  A

61. According to Bronsted Lowry acid-base theory, a substance which accepts proton is called a
a) Base  b) Acid  c) Both base and acid  d) None of the above  A

63. The ions which are attracted towards a node are called
a) Anions  b) Cations  c) Electrode  d) None of the above  A

64. The degree of dissociation of an electrolyte ________ with the increasing temperature
a) Increases  b) Decreases  c) Remains same  d) Sometimes increases, sometimes decreases  A

65. The chemical reaction in which the combination of oxygen or removal of hydrogen is involved, is called an/a
a) Oxidation reaction  b) Reduction reaction  c) Half-cell reaction  d) Overall cell reaction  A

67. Oxidation always occurs at the
a) Anode  b) Cathode  c) Electrode  d) None of the above  A

68. Electrons are gained at
a) Anode  b) Cathode  c) Electrode  d) None of the above  B

69. Oxidation number of Chromium in K₂Cr₂O₇ is
a) -3  b) +6  c) +3  d) -6  B

73. The molarity of H₂SO₄ is 0.5M Its normality will be
a) 0.5N  b) 1.0N  c) 0.25N  d) 2.0N  A

74. A 500 ml solution contains 49 gm of H₂SO₄. Its molarity is
a) 1.0M  b) 2.0M  c) 1.5M  d) 2.5m  A

76. Assuming that the oxidation number of chlorine is –1, the oxidation number of phosphorous in the compounds [P½]⁺, [P½⁻] are respectively
a) +1 and –1  b) +4 and –6  c) +5 and +3  d) +5 and +5  D

77. The pH of rain water is about 6 because air contains
a) Nitrogen  b) Oxygen  c) Carbon dioxide  d) Argon  C

80. Water shows maximum density at
a) 4°C  b) 0°C  c) 100°C  d) -4°C  A
CHEMISTRY-XI

Chapter 7

SOLUTIONS AND ELECTROLYTES

81. Which compound will act itself as an indicator?
   a) Methyl orange
   b) Phenolphthalein
   c) Potassium permanganate
   d) Methyl blue
   C

84. The chemical reaction \( CaCO_3(g) \rightarrow CaO(g) \ CO_2(g) \) shows
   a) Oxidation
   b) Reduction
   c) No change in oxidation state
   d) Both oxidation and reduction
   C

86. A loss of electron is also called
   a) Oxidation
   b) Reduction
   c) Electrolysis
   d) Valency
   A

89. What is the molarity of the solution that contains 20 grams of NaOH in 500 ml of solution?
   \([Na = 23, O = 16, H = 1]\)
   a) 0.25
   b) 0.5
   c) 1
   d) 20
   C

96. The \( pH \) of a solution that has hydrogen ion \([H^+],\) concentration of \(1 \times 10^{-4}\) mol/liter is
   a) -4
   b) 4
   c) 10
   d) -10
   B

97. The \( Kw \) of water at 25\(^{\circ}\)C is given by
   a) \(1 \times 10^7\)
   b) \(1 \times 10^{-12}\)
   c) \(1 \times 10^{-14}\)
   d) \(1 \times 10^{-10}\)
   C

98. The oxidation number of iron in \(K_3Fe(CN)_6\) is
   a) +5
   b) +4
   c) +3
   d) +2
   C

99. A solution contains A, B and C components. The mole fraction A and C are 0.25 and 0.35 respectively the mole fraction B will be
   a) 0.25
   b) 0.35
   c) 0.40
   d) 0.30
   C

100. The normality of a solution containing 4 gm of NaOH in 10 ml of solution is
    a) 10 \(N\)
    b) 1.0 \(N\)
    c) 9.8 \(N\)
    d) 11.0 \(N\)
    A

101. On dipping red litmus paper in an aqueous solution of \(NH_4Cl\), one observes
    a) No change in color
    b) Blue color is developed
    c) Red color became yellow
    d) All of the above statements are incorrect
    A

102. A solution contains 0.4 mole a component A and 0.6 mole of component B. The mole fraction of component A is
    a) 0.4
    b) 0.6
    c) 0.5
    d) 0.45
    A

103. The oxidation number of iron in \(K_3Fe(CN)_6\) is
    a) +5
    b) +4
    c) +3
    d) +2
    C

111. Salts of strong acids and strong bases have \(pH\) value of,
    a) 5
    b) 7
    c) 10
    d) 14
    B

577. A homogeneous mixture of two or more than two chemical substances is called
    a) Solute
    b) Solution
    c) Solvent
    d) Solvation
    B
SOLUTIONS AND ELECTROLYTES

578. A solution which contains a relatively small amount of solute dissolved the solvent is called
a) Dilute solution  b) Concentrated solution
c) Saturated solution  d) Ideal solution

579. The amount of solute, solvent and solution may be measured by.
   a) Volume  b) Weight
c) Number of moles  d) All these terms

587. Which substance yield ions when dissolved in water.
   a) Acids  b) Salts
c) Bases  d) All

588. The degree of dissociation depends upon.
   a) Nature of electrolyte  b) Dilution of solution
c) The temperature  d) All factors

594. Which of the following is sparingly soluble in water.
   a) H₂SO₄  b) NH₄
   c) PbCl₂  d) HCl

595. The rate of a chemical reaction is determined by.
   a) Physical methods  b) Chemical methods
c) Both methods  d) None of these

597. The amount of chemical change produced by an electric current is directly proportion to the quantity of electricity passed. This fact is known as.
   a) Faraday’s law  b) Ohm’s law
c) Newton’s law  d) Coulomb’s law

600. A cell is which a redox reaction produce an electric current is known as.
   a) Reversible cell  b) Galvanic cell
c) Electrolytic cell  d) Irreversible cell

601. The cell which converts electrical energy to chemical energy is called.
   a) Galvanic cell  b) Dry cell
c) Electrolytic cell  d) None of these

602. Electrolytes which ionize to a very small extent in solution are called.
   a) Strong electrolytes  b) Weak electrolytes
c) Moderate electrolytes  d) None of these

605. The potential different is measured by a device known as.
   a) Spectrometer  b) Viscometer
c) Voltmeter  d) Volta meter

606. The e.m.f depends on.
   a) Nature of the substance  b) Concentration of the substance
c) its temperature  d) On all these factors

608. The electrode at which oxidation reaction takes place is called.
   a) Cathode  b) Anode
c) Diode  d) Dynode

609. The electrode at which reduction takes place is called.
   a) Cathode  b) Anode
c) Diode  d) Dynode

611. Electromotive force is measured in.
   a) Joule  b) Volts
c) Coulomb  d) Ampere

612. The electrode potential of the SHE is arbitrarily chosen as.
   a) Zero  b) One
c) Two  d) Three
122. Which elements have greater reduction potential?
   a) Li  b) Cu  c) Cl  d) F  D

123. Purification of NaCl, in the saturated solution is carried out by passing.
   a) Cl₂ gas  b) HCl  c) Br₂ gas  d) I₂ Vapors  B

124. With the addition of HCl to H₂S solution, the ionization of H₂S.
   a) Increases  b) Remains constant  c) Decreases  d) None of these  C

125. The oxidation number of Mn in KMnO₄ is.
   a) +3  b) +5  c) +7  d) +9  C

126. Generally the oxidation number of oxygen is.
   a) +2  b) -2  c) -1  d) +1/2  D

127. The concentration of H⁺ and OH⁻ ions in an aqueous solution can vary from.
   a) 1 to 14  b) 1 to 10⁻¹⁴  c) 1 to 12  d) 1 to 10⁻¹⁰  B

128. The pH of 0.01 M HCl is.
   a) 4  b) 3  c) 1  d) 2  D

129. The device which is used to measure pH of solution known as.
   a) Ammeter  b) Voltmeter  c) Galvanometer  d) Potentiometer  D

130. The oxidation number of Mn in MnO₄⁻ ion is.
   a) +3  b) +5  c) +7  d) +1  C

131. The concentration of H⁺ ion in a solution having pH 7 is equal to.
   a) 10⁻¹  b) 10⁻⁴  c) 10⁻⁸  d) 10⁻⁷  D

132. Mn has +7 oxidation number in.
   a) MnSO₄  b) MnO₂  c) KMnO₄  d) K₂ MnO₄  C

133. pH of human blood is.
   a) 7  b) 7.4  c) 7.8  d) 8.4  B

134. If the pKa value is greater then the acid is.
   a) Weak  b) Strong  c) Neutral  d) None of these  A

135. If the Ka value is greater than the acid is.
   a) Weak  b) Strong  c) Neutral  d) Slightly weak  B

136. Methyl orange is used for.
   a) Redox titration  b) Acid base titration  c) Precipitation titration  d) None of these  B

137. KMnO₄ acts as an indicators on.
   a) Redox titration  b) Acid base titration  c) Precipitation titration  d) None of these  A
640. Substance containing the COOH group are called.
   a) Ketones      b) Alcohols
   c) Acids        d) Alkenes
   C

641. The % age of nitrogen in ammonia is.
   a) 80          b) 84
   c) 82          d) 81
   C

644. The oxidation number of N in HNO3 is.
   a) +1          b) +3
   c) +5          d) -5
   C

645. pH of a solution is equal to.
   a) Log[OH]     b) +log[OH]
   c) -log [H⁺]   d) Log[H⁺]
   C

646. The sum of pH and pOH is equal to.
   a) 10          b) 14
   c) 12          d) 7
   B

647. pH is determined by.
   a) Litmus paper b) Indicator
   c) pH meter     d) All these methods
   D

649. Those organic compounds whose color change depends on pH of the solution is known as.
   a) Pigments     b) Dyes
   c) Indicators   d) None of these
   C

650. Indicators are.
   a) Strong acids b) Strong bases
   c) Weak acids   d) Weak acids or weak bases
   D

651. The color of phenolphthalein in basic medium is.
   a) colorless    b) green
   c) blue        d) red
   D

652. K₂CrO₄ is used as in.
   a) acid base titrations    b) redox titrations
   c) precipitation           d) none of these
   C

656. The oxidation number of Cr in H₂CrO₄ is.
   a) +5          b) +7
   c) +3          d) +6
   D

657. How many grams of neon are present in 3 mole of neon (mol.wt = 20)
   a) 40          b) 80
   c) 20          d) 60
   D

663. Amount of NaOH required to obtain 5 liters of 0.1M solution is.
   a) 10g         b) 20g
   c) 30g         d) 40g
   B

667. What weight of NaOH is requiring for preparing 2.5 liter of 1.5M NaOH solution?
   a) 130g        b) 140g
   c) 150g        d) 160g
   C

679. The pH of an aqueous solution is 3, Its [OH⁻] will be.
   a) 10⁻¹¹        b) 10⁻⁷
   c) 10⁻³         d) 10⁻¹⁴
   A
680. The pH of 0.1 M CH₃COOH is.
   a) 0   b) 1   c) 7   d) 0.1
   B

682. The solubility product of a sparingly soluble salt AB is $1.21 \times 10^{-6}$ at 25°C. Its molar solubility is.
   a) $1.21 \times 10^{-6}$ M   b) $1.1 \times 10^{-4}$ M
   c) $1.1 \times 10^{-3}$ M   d) $1.21 \times 10^{-2}$ M
   C

684. The pH of 0.001 M HCl is.
   a) 1   b) 2   c) 3   d) 4
   C
INTRODUCTION TO CHEMICAL KINETICS

01. The branch of chemistry which deals with the study of rate of reaction and mechanism, called ________.
   a) Chemical kinetics  
   b) Chemical reaction  
   c) Concentration reaction  
   d) None of these  
   A

02. The change in concentration of reactants or products per unit time, is called ________.
   a) Acceleration  
   b) Rate of reaction  
   c) Concentration of reaction  
   d) None of these  
   B

04. During the passage of time, concentration of product ________.
   a) Decreases  
   b) Null  
   c) Full  
   d) Increases  
   D

06. Physical and ________ methods are the two main methods for the determination of reaction rate.
   a) Historical  
   b) Chemical  
   c) Tangent  
   d) Velocity  
   B

08. In chemical method, the concentration of reactants or products is measured with the interval of ________.
   a) Velocity  
   b) Volume  
   c) Pressure  
   d) Time  
   D

12. The rate of reaction depends upon only one factor that is ________.
   a) Temperature  
   b) Water  
   c) Fire  
   d) None of these  
   A

14. The factor affects the rate of chemical reaction is ________.
   a) Heat  
   b) Catalyst  
   c) Energy  
   d) None of these  
   B

15. The rate of chemical reaction is proportional to the molar ________ of reacting substances.
   a) Concentrations  
   b) Molecules  
   c) Energy  
   d) Volume  
   A

16. A catalyst is a substance which is not consumed in a reaction but ________ the rate of reaction.
   a) changes  
   b) Homogeneous  
   c) Greater  
   d) Catalyst  
   A

17. Catalytic reactions are divided into ________ main types.
   a) Three  
   b) Two  
   c) Five  
   d) Four  
   B

18. The substance, which slows down a reaction, is called ________.
   a) Inhibitor  
   b) Reactant  
   c) Rate of law  
   d) None of these  
   A

19. Potassium is poisoned by ________.
   a) Inhibitors  
   b) Zinc  
   c) Arsenic  
   d) Calories  
   C

02. The change in concentration of reactants or products per unit time is called ________.
   a) Reaction rate  
   b) Rate constant  
   c) Diffusion  
   d) Chemical kinetic  
   A

09. For a reaction system the minimum amount of energy which molecules must have not form an activated complete is called ________.
   a) Activation energy  
   b) Ionization energy  
   c) Reaction energy  
   d) None of the above  
   A

10. The relationship between rate of reaction and masses (molar concentration) of reacting substance is summarized as ________.
   a) Law of mass action  
   b) Le-Chatelier principle  
   c) Charle’s law  
   d) Ideal gas law  
   A
11. The energy of activation is usually expressed in.
   a) Joules   b) Calories.
   c) Ergs   d) None of the above

12. When catalyst and reactants are present in same phase, catalyst is called.
   a) Homogeneous catalyst   b) Heterogeneous
   c) Organic catalyst   d) None of the above

13. The main function of catalyst is to.
   a) Lower of activation energy   b) Lower temperature
   c) Increase in activation energy   d) Lower pressure

14. Those substance which make catalyst more effective.
   a) Accelerator   b) Inhibitors
   c) Promoter   d) None of the above

02. The reaction which may proceed slowly with measurable rate is called.
   a) Slow reaction   b) Fast reaction
   c) Moderate reaction   d) None of the above

03. The branch of chemistry which deals with the study of reaction rates is known as.
   a) Chemical kinetic   b) Chemical equilibrium
   c) Electro chemistry   d) None of the above

04. The experimental relationship between a reaction rate and the concentration of reactants is called.
   a) Order law   b) Rate law
   c) Moleculirity   d) None of the above

05. The change of concentration of reactants and products in a unit time.
   a) Rate of reaction   b) Order of reaction
   c) Moleculirity   d) None of the above

06. The minimum amount of energy required to form an activated complex is called.
   a) Reaction energy   b) Activation energy
   c) Deactivation energy   d) None of the above

07. The number of atoms or molecules whose concentration determined the rate of reaction is called.
   a) Rate of reaction   b) Order of reaction
   c) Moleculirity   d) None of the above

09. The velocity of reaction depends upon which of the following factors.
   a) Nature of reactants   b) Concentration of reactants
   c) Temperature at which the reactants is carried out
d) All of the above

10. If the velocity of reaction is independent of the concentration of the reaction, then it belongs to which category of reactions.
   a) Zero order reaction   b) First order reaction
   c) Second order reaction   d) Third order reaction

13. Ionic reaction are ________ than non ionic reactions.
   a) Slower   b) Moderate
   c) Faster   d) None of above

15. I₂+H₂ → 2HI is ________ order reaction.
   a) Second   b) Zero
   c) First   d) Third

17. In the presence of suitable catalyst , the rate of a reaction is.
   a) Increases   b) Decreases
   c) Remains constant   d) Increases as well as decrease
20. The substance which decrease the effects of catalysts are.
a) Promoters  b) Inhibitors  
c) Specificity  d) None of the above  B
25. A chemical substance used to increase the rate of a chemical reaction is called.
a) Catalyst  b) Catalysis  
c) Inhibitors  d) Promoters  A
26. The reactions which proceed at moderate rates are.
a) Very fast  b) Very slow  
c) Normal  d) High  C
32. When there is an increase in concentration, the rate of reaction.
a) Increases  b) Decreases  
c) Remain constant  d) None of above  A
33. Ionic reactions such as neutralization reactions involving H⁺ and OH⁻ ions are usually ______ as compared to the molecular reactions.
   a) Very fast  b) Very slow  
c) Sluggish  d) None of these  A
34. Molecular reactions usually proceed at.
a) Very fast rates  b) Slow rates  
c) Moderate rates  d) Ordinary rates  C
38. With the increase in temperature, the rate of reaction.
a) Increases greatly  b) Does not increase  
c) Increases a little  d) None of above  A
39. The decrease in the catalytic property of catalyst is called the.
a) Poisoning of a catalyst  b) Limit of a catalyst  
c) Specificity of a catalyst  d) None of the above  A
40. The average rate of reaction between two intervals is ______ to the reaction rate at any moment.
a) Equal  b) Not equal  
c) Balanced  d) Higher  B
41. The pH of water is greater at temperature of.
a) 14°C  b) 15°C  
c) 18°C  d) 25°C  A
42. Water at 25°C is.
a) Neutral  b) Acid  
c) Basic  d) None of the above  A
43. Mercury is the best liquid for barometer, because.
a) Its high density keep the instrument small  
b) It does not evaporate rapidly  
c) It is unfairly reactive  
d) All the above  D
45. In a reaction  A+ 2B → product, the molecularity of the reaction is given by
   a) 3  b) 2  
c) 1  d) 0  A
46. For a reaction 2A+B → product, the active mass of B is kept constant and that of A is doubled. 
The rate of reaction will then.
   a) Increases 2 times  b) Increases 4 times  
c) Decreases 2 times  d) Decreases 4 times  B
47. The rate law of for a chemical reaction  N₂O₅ →2NO₂+1/2 O₂ is shown as Rate=K[N₂O₅] identity the order of the reaction.
a) First order  b) Second order  
c) Third order  d) Zero order  A

- 3 -
48. The rate law of chemical reaction \(2\text{NO}_2(g) \rightarrow 2\text{NO}(g)+\text{O}_2(g)\) is represented by experience rate by \(K[\text{NO}_2]^2\) the order of reaction is.
   a) First order  b) Second order  c) Third order  d) Zero order  
   Answer: B

50. Consider the reaction \(\text{H}_2 (g)+\text{I}(g) \rightarrow 2\text{HI} (g)\) the order of reaction for this is.
   a) 1  b) 2  c) 3  d) 2.5  
   Answer: A

51. Reactions with high activation energy are.
   a) Slow  b) Fast  c) Moderate  d) does not take place  
   Answer: A

53. Use of catalyst in a reaction changes.
   a) Enthalpy  b) Entropy  c) Internal energy  d) Activation energy  
   Answer: D

57. A chemical reaction is characterized by.
   a) Concentration  b) Temperature  c) Catalyst  d) All the above  
   Answer: D

59. Kinetic energy is given by the.
   a) \(K.E=1/2(	ext{mass of object}) \times (\text{velocity of object})^2\)  
   b) \(K.E=(\text{mass of object}) \times (\text{velocity of object})^2\)  
   c) \(K.E=1/2(	ext{mass of object}) \times (\text{velocity of object})\)  
   d) \(K.E=1/2(	ext{mass of object})^2 \times (\text{velocity of object})\)  
   Answer: A

66. In the chemical reaction \(\text{XCIO}_2+\text{Y} \rightarrow \text{X Cl}+\text{O}_2+\text{Y}\), which of the substance is a catalyst?
   a) \(\text{XCIO}_2\)  b) \(\text{Y}\)  c) \(\text{XCl}\)  d) \(\text{O}_2\)  
   Answer: B

687. The rate reaction depends up.
   a) Concentration  b) Temperature  c) Catalyst  d) All of these  
   Answer: D

689. The rate of reaction is expressed in units of
   a) \(\text{Mol dm}^{-3}\text{s}^{-1}\)  b) \(\text{Mol dm}^{-3}\)  c) \(\text{Mol dm}^{-3}\)  d) \(\text{Mol}^{-1}\text{dm}^3\text{s}^{-1}\)  
   Answer: A

694. The rate of reaction depends on
   a) Catalyst  b) Concentration  c) Temperature  d) All these  
   Answer: D

697. The order of decreasing strength of halogen acids is
   a) \(\text{HI} > \text{HCl} > \text{HBr}\)  b) \(\text{HBr} >\text{HCl} > \text{HI}\)  c) \(\text{HI} > \text{HBr} >\text{HCl}\)  d) \(\text{HCl} > \text{HI} > \text{HBr}\)  
   Answer: C
CHEMISTRY-XI
INTRODUCTION TO CHEMICAL KINETICS

Chapter 8

698. Phenolphthalein is an example of
   a) Redox indicator   b) Acid-base indicator
   c) Precipitation indicator   d) None of these

   B

699. The colour of phenolphthalein in acidic medium is
   a) Red   b) Yellow
   c) Orange   d) Colourless

   D

700. The colour of methyl orange in alkaline medium is
   a) Red   b) Yellow
   c) Blue   d) Colourless

   B

704. When ice melts, then it takes place
   a) Physical change   b) Chemical change
   c) No change   d) All possible

   A

705. Total number of atoms or molecules taking part in a chemical reaction is known as
   a) order   b) Molecularity
   c) rate constant   d) rate of reactions

   B

706. The rate of reaction depends upon
   a) initial concentration of reactants   b) extent of reaction
   c) temperature   d) time of reaction

   C

707. Which of the following factors does not influence the rate of reaction?
   a) concentration of the reactants   b) nature of the reactants
   c) molecularity of the reaction   d) temperature

   C

708. The activation energy of a reaction may be lowered
   a) by raising the temperature   b) by lowering the temperature
   c) by removing the products   d) by adding a catalyst

   D

709. If the rate of reaction is independent of the concentration of the reactant, the reaction is of
   a) zero order   b) first order
   c) second order   d) third order

   A

716. Those substances which slow down a reaction are called
   a) catalysts   b) promoters
   c) inhibitors   d) none of these

   C

718. Which of the following acts as inhibitor?
   a) As   b) pyridine
   c) quinoline   d) all these

   D

719. The specific rate constant of a first order reaction depends on the:
   a) Concentration of reactant   b) Concentration of product
   c) Time   d) Temperature

   D

720. A zero order reaction is one:
   a) In which reactants do not react   b) In which one of the reactant is in large excess
   c) Whose rate is not affected by concentration   d) Whose rate is independent of temperature

   D

724. For the single step reaction $2A + B \rightarrow A_2B$, Rate =?
   a) $K [A] [B]$   b) $K [A] [B]^2$

   C