

XI-Chemistry MCQs
I.I.T. foundation Course

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I.I.T.Foundation - XI Chemistry MCQ #1

Time: 45 min Student's Name: _____

Full Marks: 60

Some Basic Concepts of Chemistry

I. MCQ - Choose Appropriate Alternative

1. The process in which a solid directly changes to vapours without melting is called _____.

(Evaporation, Condensation, Sublimation)

2. The oxidation number of P in PO_3^{-4} is _____.

(3+, 5+, 3-)

3. The pH of 0.001 M HCl is _____.

(2, 4, 3)

4. K (rate constant) is dependent on _____.

(temperature, concentration, volume)

5. The universal indicator in water shows the colour _____.

(red, green, blue)

6. The pH of blood is _____.

(7.3, 8.4, 5.6)

7. The oxidation potential of hydrogen electrode is _____.

(0.0 volt, +0.76volt, -0.36volt)

8. _____ quantum number describes the shape of a molecule.

(Principal, Azimuthal, Spin)

9. An orbital can have the maximum number of two electrons but with opposite spin, it is called _____.

(Pauli's Exclusion Principle, Hund's Rule, Aufbau Principle)

10. When α -particle is emitted from the nucleus of radioactive element, the mass number of the atom _____.

(Increases, Decreases, Does not change)

11. Dissociation of KClO_3 is a _____ process.

(Reversible, Irreversible)

12. The e/m ratio of cathode rays is the _____ when Hydrogen is taken in the discharge tube.

(Lowest, Highest)

13. The negative ion tends to expand with the _____ of negative charge on it.

(Decreases, Increases)

14. Ionic compounds have _____ melting points.

(Low, High)

15. The allotropic forms of an element are called _____.

(Polymorphs, Isomorphs)

16. Absolute Zero is equal to _____.

(273.16°C, -273.16°C)

17. The compounds having hydrogen bond generally have _____ boiling points.

(High, Low)

18. Surface tension _____ with the rise of temperature.

(Increases, Decreases)

19. Mercury forms _____ meniscus in a glass tube.

(concave, convex)

20. The reactions with the high value of energy of activation are _____.

(slow, fast)

21. 2.000 has/have _____ significant figure(s).

(1, 4)

22. $E + PV$ is called _____.

(Entropy, Enthalpy)

23. The shorter the bond length in a molecule, the _____ will be bond energy.

(Lesser, Greater)

24. Positive rays are produced from _____.

(Anode, Cathode, Ionization of gas in a discharge tube)

25. _____ of the following contains the fewer number of molecules.

(1 gm of hydrogen, 4 gm of oxygen, 2 gm of nitrogen)

26. the true statement about the average speed of the molecules of hydrogen, oxygen and nitrogen confined in a container is _____.

(Hydrogen is quicker, Oxygen is quicker, The molecules of all the gases have the same average speed)

27. The correct statement about the glass is _____.

(It is crystalline solid, Its atoms are arranged in an orderly fashion, It is a super cooled liquid)

28. When a substance that has absorbed energy emits it in the form of radiation the spectrum obtained is _____.

(Continuous Spectrum, Line Spectrum, Emission Spectrum)

29. _____ of the overlap forms strong bond.

(s-s, p-s, p-p)

30. _____ compound has a greater angle between a covalent bond.

(H₂O, NH₃, CO₂)

31. When sodium chloride is mixed in water then _____.

(pH is changed, NaOH and HCl are formed, Sodium and chloride ions become hydrated)

32. The boiling point of a liquid _____ with an increase in pressure.

(Decreases, Increases, remains constant)

33. An Azimuthal Quantum Number describes the _____.

(size of an atom, shape of an orbital, spin of orbital)

34. The rate of the backward reaction is directly proportional to the product of the molar concentration of _____.

(Reactants, Products, None of them)

II. Fill in the Blank

1. The property of a crystal, which is different in different directions, is called _____.

2. 0.00051 contains _____ significant figures.

3. The oxidation number of oxygen in OF₂ is _____.

4. The volume of 1 gm of hydrogen gas at S.T.P is _____.

5. The oxidation number Mn in KMnO_4 is _____.
6. The product of ionic concentration in a saturated solution is called _____.
7. 16 gm of oxygen at S.T.P occupies a volume of _____ dm^3 .
8. The shape of the orbital for which $l = 0$ is _____.
9. The radius of Cl^{-1} is _____ than the radius of Cl^0 .
10. sp^2 hybridization is also known as _____.
11. The value of 1 Debye is _____.
12. The reactions catalyzed by sunlight are called _____.
13. The blue colour of CuSO_4 is due to the presence of _____.
14. The force of attraction between the liquid molecules and the surface of container is called _____.
15. The heat of neutralization of a strong acid and a strong base is _____.
16. $\text{C} \equiv \text{C}$ triple bond is _____. $\text{C} = \text{C}$ double bond length.
17. The ions having the same electronic configuration are called iso electronic.
18. On heating, if a solid changes directly into vapours without changing into the liquid state, the phenomenon is called _____.
19. Each orbital in an atom can be completely described by _____.
20. In a molecule of alkene, _____ restricts the rotation of the group of atoms at either end of the molecule.
21. Density, refractive index and vapour pressure are _____ properties.
22. The addition of HCl to H_2S solution _____ the ionization of H_2S .
23. The reaction of cation or anion (or both) with water so as to change its _____ is known as Hydrolysis.
24. A reaction with higher activation energy will start at _____ temperature.
25. 6.02×10^{23} has _____ significant figures.
26. The internal resistance in the flow of liquid is called _____.

I.I.T.Foundation - XI Chemistry MCQ #1A

Time: 45 min Student's Name: _____

Full Marks: 90

Mole Concept

I. MCQ - Choose Appropriate Alternative

1. The formula, which gives the simple ratio of each kind of atoms present in the molecule of compound, is called _____.

(Molecular Formula, Empirical Formula, Structural Formula)

2. The formula, which expresses the actual number of each kind of atom present in the molecule of a compound, is called _____.

(Empirical Formula, Molecular Formula, Structural Formula)

3. Mole is a quantity, which has _____ particles of the substance.

(One billion, 6.02×10^{23} , 1.013×10^5)

4. The simplest formula of a compound that contain 81.8% carbon and 18.2% hydrogen is _____.

(CH₃, CH, C₂H₆)

5. The empirical Formula of a compound _____.

(is always the same as the molecular formula, Indicates the exact composition, Indicates the simplest ratio of the atoms)

6. Very small and very large quantities are expressed in terms of _____.

(significant figures, Exponential Notation, Logarithm)

7. Two moles of water contains _____ molecules.

(6.02×10^{23} , 1.204×10^{24} , 3.01×10^{23})

8. One mole of Cl⁻ ions contains _____ ions.

(6.02×10^{23} , 1.204×10^{24} , 3.01×10^{23})

9. 220 gms of CO₂ contains _____ moles of CO₂.

(One, Five, Ten)

10. In rounding off _____ figure is dropped.

(First, Last, No)

11. Precision is linked with _____.

(Individual measurements, Actual results, Accepted Value)

12. Accuracy refers to how closely a measured value agrees with _____.

(Individual result, Actual result, Average value)

13. 6600 contains _____ significant figures.

(2, 3, 4)

14. 3.7×10^4 contains _____ significant figures.

(2, 3, 5)

15. 9.40×10^{-19} contains _____ significant figures.

(2, 3, 5)

16. The figure 39.45 will be rounded off to _____.

(39.4, 39.5, 39)

17. _____ means that the result obtained in different experiments are very close to the accepted values.

(Accuracy, Precision, Significant Figure)

18. The average weight of atoms of an element as compared to the weight of one atom of carbon taken as _____ is called the atomic weight.

(12, 13, 14)

19. 58.5 is _____ of NaCl.

(Atomic weight, Formula Weight, Molecular Weight)

20. 18.0 a.m.u is the _____ weight of water.

(Atomic, Formula, Molecular)

21. 28 gms of nitrogen will have _____ molecules.

(6.02×10^{23} , 12.04×10^{23} , 3.01×10^{23})

22. 22.4 dm^3 of CO_2 is _____ 22.4 dm^3 of SO_2 .

(Heavier than, Lighter than, Equal to)

23. 100 gms of water is equal to _____ moles.

(5.56, 27.78, 6.25)

24. The reactions, which proceed in both the directions are called _____ reactions.

(Reversible, Irreversible, Neutrilization)

25. The reactions, which proceed in forward direction only are called _____ reactions.

(Reversible, Irreversible, Ionic)

26. Molecular weight is used for _____ substances.

(Ionic, Non ionic, Neutral)

27. Formula weight is used for _____ substances.

(Ionic, Non ionic, Neutral)

28. The modern system of measurement is called _____ system.

(SI, Metric, F.P.S)

29. The S.I unit of mass is _____.

(kilogram, gram, pound)

30. One mole of glucose contains _____ gms.

(100, 180, 342)

II. Fill in the Blank

1. 1 mole of a gas at S.T.P occupies a volume of _____.

2. A gas occupying a volume of 22.4 dm^3 at S.T.P contains _____ molecules.

3. A formula, which gives the relative number of atoms in the molecule of a compound, is called _____.

4. A formula which gives the actual number of all kinds of atoms present in the molecule of compound is termed as _____.

5. The chemical formula that not only gives the actual number of atoms but also shows the arrangement of different atoms present in the molecule is called _____.

6. Atomic weight or molecular weight expressed in grams is known as _____.

7. 2 moles of H_2O contain _____ grams and _____ number of molecules.

8. Any thing that occupies space and has _____ is called matter.

9. Volume of one _____ mole of a gas at S.T.P is 22.4 cubic feet.

10. A ton mole of iron is equal to _____ tons.

11. The force with which the earth attracts a body is called the _____ of the body.
12. A pure substance contains _____ kind of molecules.
13. The smallest indivisible particle of matter is called _____.
14. The atomic number is equal to the number of _____ in nucleus.
15. The atomic mass is the total number of protons and _____ in an atom of the element.
16. The average weight of atoms of an element as compared to the weight of one atom of _____ is called the atomic mass.
17. 1.0007 contains _____ significant figures.
18. The figure 24.75 will be rounded off to _____.
19. _____ means that the readings and measurements obtained in different experiments are very close to each other.
20. _____ means that the results obtained in different experiments are very close to the accepted values.
21. The degree of a measured quantity _____ with increasing number of significant figures in it.
22. The atomic mass of sodium is _____.
23. The symbolic representation of a molecule of a compound is called _____.
24. Molecular formula of CHCl_3 and its Empirical formula is _____.
25. Molecular formula of benzene is C_6H_6 and its empirical formula is _____.
26. 58.5 is the _____ of NaCl.
27. 4.5 gms of nitrogen will have _____ molecules.
28. 28 gms of nitrogen will have _____ molecules.
29. 2 moles of SO_2 is equal to _____ gms.
30. 1000 gms of H_2O is equal to _____ moles.
31. The reactions, which proceed in both directions, are called _____.
32. The reactions, which proceed in forward directions only, are called _____ reactions.
33. The _____ reactions are completed after some time.
34. 0.0006 has _____ significant figures
35. 7.40×10^8 has _____ significant figures.

36. 7×10^8 has _____ significant figures.
37. Usually Molecular formula is simple multiple of the _____.
38. 0.1 mole of H_2O contains _____ molecules of H_2O .
39. Mass of 3.01×10^{22} molecules of CO_2 is _____.
40. _____ is the branch of science which deals with the properties, composition and structure of matter.
41. None zero digits are all _____.
42. The integer part of logarithm is called _____.
43. The decimal fraction of logarithm is called _____.
44. _____ is the amount of substance, which contains as many number of particles as there are in 12 gms of Carbon.
45. 6.02×10^{23} is called the _____.
46. The accuracy of measurement depends on the number of _____.
47. _____ is the branch of chemistry that deals with quantitative relationships among the substances undergoing chemical changes.
48. The sum of atomic weights of all the elements present in molecular formula is called the _____.
49. _____ is the sum of atomic weights of the elements represented by the Empirical formula of the compound.
50. Very small and very large quantities are expressed in terms of _____.
51. In rounding off _____ figure is dropped.
52. Mole is the quantity, which has _____ particle of the substance.
53. For three significant figures, 25.55 is rounded off to _____.
54. The S.I unit of a mass is _____.
55. Mass of 6.02×10^{23} molecules of NaCl is _____ gm.
56. 1 mole of NaOH is _____ gm of NaOH .
57. Formula weight is used for _____ substances.
58. The word S.I stands for _____.
59. 4.5 gms of water will have _____ molecules.
60. 0.0087 has _____ significant figure.

I.I.T.Foundation - XI Chemistry MCQ #2

Time: 45 min Student's Name: _____

Full Marks: 90

Structure of Atom

I. MCQ - Choose Appropriate Alternative

1. The charge on an electron is _____.

(-2.46×10^4 coulombs, -1.6×10^{-19} coulombs, 1.6×10^{-9} coulombs)

2. The maximum number of electrons that can accommodated by a p-orbital is _____.

(2, 6, 10)

3. A proton is _____.

(a helium ion, a positively charged particle of mass 1.67×10^{-27} kg, a positively charged particle of mass 1/1837 that of Hydrogen atom)

4. Most penetrating radiation of a radioactive element is _____.

(a-rays, b-rays, g-rays)

5. The fundamental particles of an atom are _____.

(Electrons and protons, electrons and neutrons, Electrons, Protons, Neutrons)

6. The fundamental particles of an atoms are _____.

(the number of protons, The number of neutrons, The sum of protons and neutrons)

7. "No two electrons in the same atoms can have identical set of four quantum numbers." This statement is known as _____.

(Pauli's Exclusion Principle, Hund's rule, Aufbau Rule)

8. _____ has the highest electronegativity value.

(Fluorine, Chlorine, Bromine)

9. Principle Quantum number describes _____.

(Shape of orbital, size of the orbital, Spin of electron in the orbital)

10. Canal rays are produced from _____.

(Anode, Cathode, Ionization of gas in the discharge tube)

11. Electromagnetic radiation produce from nuclear reactions are known as _____.

(a-rays, b-rays, g-rays)

12. Cathode rays consist of _____.

(Electrons, Protons, Positrons)

13. The properties of cathode rays _____ upon the nature of the gas inside the tube.

(depend, partially depend, do not depend)

14. Anode rays consists of _____ particles.

(Negative, Positive, Neutral)

15. Atomic mass of an element is equal to the sum of _____.

(electrons and protons, protons and neutrons, electrons and neutrons)

16. Neutrons were discovered by _____.

(Faraday, Dalton, Chadwick)

17. The value of Plank's constant is _____.

(6.626×10^{-34} , 6.023×10^{24} , 1.667×10^{-28})

18. P-orbitals are _____ in shape.

(spherical, diagonal, dumb bell)

19. The removal of an electron from an atom in gaseous state is called _____.

(Ionization energy, Electron Affinity, Electronegativity)

20. The energy released when an electron is added to an atom in the gaseous state is called _____.

(Ionization Potential, electron Affinity, Electronegativity)

21. The power of an atom to attract a shared pair of electrons is called _____.

(Ionization Potential, Electron Affinity, Electronegativity)

22. Electronegativity of Fluorine is arbitrarily fixed as _____.

(2, 3, 4)

23. The energy difference between the shells go on _____ when moved away from the nucleus.

(Increasing, decreasing, equalizing)

24. _____ discovered that the nucleus of an atom is positively charged.

(William Crooke's, Rutherford, Dalton)

25. Isotopes are atoms having same _____ but different _____.

(Atomic weight, Atomic number, Avogadro's Number)

26. _____ consists of Helium Nuclei or Helium ion (He^{++}).
27. The angular momentum of an electron revolving around the nucleus of atom is _____.
($nh/2\pi$, $n^2h^2/2\pi$, $nh^3/3\pi$)
28. The wavelengths of X-rays are mathematically related to the _____ of anticathode element.
(atomic weight, atomic number, Avogadro's number)
29. Lyman Series of spectral lines appear in the _____ portion of spectrum.
(Ultraviolet, Infra red, Visible)
30. According to _____ electrons are always filled in order of increasing energy.
(Pauli's Exclusion Principle, Uncertainty Principle, Aufbau Principle)

II. Fill in the Blank

1. The maximum number of electrons in 2p orbital is _____.
2. 3d orbital has _____ energy than 4s orbital.
3. _____ rays are non-material in nature.
4. Charge to mass ratio of cathode rays resembles to that of _____.
5. _____ rays are most penetrating.
6. Neutrons have mass equal to that of _____.
7. Energy is _____ when an electron jumps from higher to lower orbit.
8. Second Ionization Potential has _____ value than the First Ionization Potential.
9. Electronegativity _____ from left to right in a period of Periodic Table.
10. _____ was discovered during the course of Artificial Radioactivity.
11. The velocity of alpha rays is nearly _____ of velocity of light.
12. Natural Radioactivity is confined in _____ elements.
13. The isotopes of an element differ in their _____.
14. Two electrons with the _____ spin, can never occupy the same atomic orbital.
15. 'Al' has electronic configuration, $1s^2$, $2s^2$, _____.
16. In a group of Periodic Table, the ionization potential _____ from top to bottom as the size of atom increases.
17. Ionization potential values _____ from left to right in a period.

18. The energy required to remove the most loosely bond electron from an atom in gaseous state is called _____.
19. The SI unit of Ionization Potential is _____.
20. An atom of sodium possesses 11 protons and _____ neutrons.
21. The particles of Cathode rays possess _____ charge.
22. The negatively charged particles found in Cathode rays are named as _____.
23. Positive rays are emitted from _____.
24. _____ rays are also known as Canal rays.
25. _____ consists of helium ions and are doubly positively charged.
26. _____ rays consists of negatively charged particles.
27. _____ rays are light waves of very short wavelength.
28. The phenomenon in which a stable element is made radioactive by artificial disintegration is called _____.
29. The electron move around the nucleus in different circular paths called _____.
30. The maximum number of electron in a shell is determined by the formula _____.
31. A particle whose mass is equal to that of electron but carries a positive charge is called _____.
32. 2p electrons are _____ in energy that 2s electrons in the same atom.
33. Number of protons of an element also indicates its _____.
34. According to _____ Principle electrons are fed in the order of increasing orbital energy.
35. According to _____ electrons are distributed among the orbitals of a sub shell to give maximum number of unpaired electron and have same spin.
36. The specific way in which the orbitals of an atom are occupied by electrons is called _____.
37. _____ rays are stream of doubly positively charged particles.
38. Electron in the outer most shell of an atom is called _____.
39. Protons are found in the _____ of an atom and bear _____ charge.
40. The atomic number of an atom is the sum of _____ inside the nucleus.
41. _____ limits the number of electron to different shell or orbits.
42. Sir William Crookes in 1878, discovered that the cathode in high vacuum tube emit radiations what he called _____.
43. X-rays were discovered in 1895 by _____.

44. The discovery of proton was done in 1886 by _____.
45. Neutrons were discovered by _____ in 1932 by the bombardment of beryllium with alpha particles.
46. Each atom has a _____, which contains all the positive charge and practically all the mass of atom.
47. Complete the reaction: $4\text{Be}_9 + 2\text{H}_4 \rightarrow$ _____ + _____.
48. _____ have higher ionization power as compared to b-rays.
49. No dark spaces between the colours are present in _____.
50. The symbol e^+ represents _____.
51. p-orbitals are _____ shaped.
52. The energy released when an electron is added to an atom in the gaseous state is called _____.
53. The power of an atom to attract a shared pair of electrons towards itself is called _____.
54. Fluorine is _____ electronegative than chlorine.
55. Lyman series of spectral lines appear in the _____ portion of spectrum.
56. The electrons with _____ spin occupy the same orbital.
57. 3d orbital has _____ energy than 4s orbital.
58. Energy and frequency are _____ proportional to each other.
59. Ionic radii of cations are _____ than the atoms from which they are formed.
60. Ionic radii of anions are _____ than the atoms from which they are formed.

I.I.T.Foundation - XI Chemistry MCQ #2

Time: 45 min Student's Name:

Full Marks: 90

Periodic Classification of Elements & Periodicity

I. MCQ - Choose Appropriate Alternative

- Which of the following pairs are chemically dissimilar?
(A) Na and K (B) Ba and Sr
(C) Zr and Hf (D) Ca and Zn.
- The total number of inner transition elements is
(A) 10 (B) 14
(C) 28 (D) 30
- The alkali metal which is liquid at 15°C is
(A) K (B) Cs
(C) Na (D) None
- Which of the following ion will form most water soluble hydroxide?
(A) K^+ (B) Ni^{2+}
(C) Zn^{2+} (D) Al^{3+}
- Which of the following has greatest tendency to lose electron?
(A) F (B) Fr
(C) S (D) Be.
- The oxide of which of the following elements will be acidic in character
(A) Mg (B) Rb
(C) Li (D) Cl
- Which of the following is isoelectronic with carbon atom?
(A) Na^+ (B) Al^{3+}
(C) O_2^- (D) N^+
- Which of the following ions are paramagnetic in character?
(A) Zn^{2+} (B) Cu^+
(C) Ni^{2+} (D) Ag^+
- Ca^{2+} ion is isoelectronic with
(A) Mg^{2+} (B) Na^+
(C) Ar (D) Kr
- Gradual addition of electronic shells in the noble gases causes a decrease in their
(A) Ionization energy (B) atomic radius
(C) Boiling point (D) density.
- Which of the following has highest first ionization potential?
(A) Carbon (B) Oxygen
(C) Nitrogen (D) Boron.

12. Which of the following has the smallest size?
(A) Na^+ (B) Mg^{2+}
(C) Al^{3+} (D) Cl
13. Which of the following element has the maximum electron affinity?
(A) F (B) S
(C) I (D) Cl.
14. Which of the following is isoelectronic as well as has the same structure as that of N_2O ?
(A) N_3H (B) H_2O
(C) NO_2 (D) CO_2
15. The atomic radius increases as we move down a group because
(A) Effective nuclear charge increases
(B) Atomic mass increases
(C) Additive electrons are accommodated in new electron level
(D) Atomic number increase.
16. Which one of the following is an incorrect statement?
(A) The ionization potential of nitrogen is greater than that of chlorine
(B) The electron affinity of fluorine is greater than that of chlorine
(C) The ionization potential of beryllium is greater than that of boron
(D) The electronegativity of fluorine is greater than that of chlorine.
17. Electron affinity depends on
(A) Atomic size
(B) Nuclear charge
(C) Atomic number
(D) Atomic size and nuclear charge both.
18. Two elements whose electronegativities are 1.2 and 3.0, the bond formed between them would be
(A) Ionic (B) covalent
(C) Coordinate (D) metallic.
19. Ionic radii are
(A) Directly proportional to square of effective nuclear charges
(B) Inversely proportional to effective nuclear charge
(C) Inversely proportional to square of effective nuclear charge
(D) Directly proportional to effective nuclear charge.
20. Which of the following oxides is atmospheric in character?
(A) CaO (B) CO_2
(C) SiO_2 (D) SnO_2
21. Mark the correct statement:
(A) Na^+ is smaller than Na atom (B) Na^+ is larger than Na atom
(C) Cl^- is smaller than Cl atom (D) Cl^- and Cl are equal in size
22. Who introduced the zero groups?
(A) Lothar Meyer (B) Lockery
(C) Mendeleev (D) Ramsay

23. Element, of group I-B are called
(A) Representative elements
(B) Transition elements
(C) Rare earth
(D) Coinage metals
24. The element with $Z = 24$ is placed in the period
(A) 5 (B) 2
(C) 3 (D) 4
25. Which is the part of metalloids?
(A) Na and K (B) F and Cl
(C) None of these (D) Cu and Au
26. Which one of the following has the maximum electron affinity?
(A) I (B) Br
(C) Cl (D) F
27. On electrolysis of NaH, hydrogen is liberated
(A) At anode (B) in the electrolyte
(C) At cathode (D) none of them
28. Elements with greater number of electrons have _____ values of ionization energy.
a) Only one b) More than one
c) Zero d) Infinite
29. Which of the following possess maximum hydration power?
a) Na^+ b) K^+
c) Mg^{+2} d) Ca^{+2}
30. Higher value of electron affinity means _____
a. Atom will lose electron easily
b. Atom will gain electron easily
c. Atom may form di-positive ion
d. The reason is unknown
31. Melting points of VII-A group _____ down the group
a. Increase b. Decrease
c. Remain constant d. No regular trend
32. Oxidation state of an atom represents _____
a. No. of electrons gained
b. No. of electrons lost
c. No. of electrons gained or lost
d. None of above correctly represent it
33. Mendeleev's periodic table was based on
a) Atomic number b) Atomic mass
c) Atomic volume d) Electronic configuration
34. Elements present in a same group have the same
a) Atomic number b) Molecular weight
c) Chemical properties d) Electronic configuration

35. "s" and "p" block elements are also called
- Transition elements
 - Inert elements
 - Typical elements
 - Rare earth elements
36. What is the symbol of the element with only three electrons and three protons?
- Li
 - C
 - Ag
 - Cu
37. Elements with seven electrons in their valence shell are known as
- Inert
 - Lanthanides
 - Halogens
 - Alkali metals
38. Which of the following pairs of elements are chemically most similar?
- Na and Al
 - Cu and Cu
 - S and F
 - Sc and Zn
39. A student of chemistry will identify positively the following symbols as sodium
- Na
 - Mg
 - Sd
 - So
40. In the periodic table each period begins with a metal, which is
- Most electronegative
 - Most electropositive
 - Less electropositive
 - Less electronegative
41. Which one of the following is not a coinage metal?
- Au
 - Cu
 - Ag
 - Pd
42. Which is the most metallic element of 2nd period?
- Lithium
 - Beryllium
 - Boron
 - Carbon
43. The outer most orbital involved in chemical bonding is called
- Molecular orbital
 - Complete orbital
 - Valence orbital
 - Free orbital
44. Elements, which form basic oxides are
- Electropositive
 - Electronegative
 - Inert
 - None of these
45. Which of the following has the most basic character?
- Na_2O
 - MgO
 - Al_2O_3
 - P_2O_3
46. Which of the following is smallest in size?
- K^{+1}
 - O^{-2}
 - F^{-1}
 - Na^{+}

47. Ionization energy is lowest for
a) Inert gases b) Halogens
c) Alkali metals d) Alkaline earth metals
48. An isotope of hydrogen is
a) Neptunium b) Plutonium
c) Thorium d) Tritium
49. With respect to chlorine, hydrogen will be
a) Electropositive b) Electronegative
c) Neutral d) None of these
50. Which of the following has the highest electron affinity?
a) $1S^2 2S^2 2P^3$ b) $1S^2 2S^2 2P^6 3S^1$
c) $1S^2 2S^2 2P^5$ d) $1S^2 2S^2 2P^5$
51. Excluding hydrogen and helium, the smallest elements in the periodic table is
a) Lithium b) Fluorine
c) Cesium d) Iodine
52. Which halogen has the smallest electron affinity?
a) F b) Cl
c) Br d) I
53. The element with atomic number 7 is likely to have same properties to the element whose atomic number is
a) 11 b) 2
c) 15 d) F
54. Which of the following will have largest size?
a) Br b) I⁻
c) I d) F
55. In its chemical properties, calcium is most similar to
a) Cs b) Cu
c) Sc d) Sr
56. Which two of the following are iso electronic with one another?
a) Na⁺ and O b) Na⁺ and K⁺
c) Na⁺ and Ne d) Ne and O
57. Which of the following is a transuranic element?
a) Americium b) Plutonium
c) Neptunium d) All of these
58. The hydrogen, which is present in the atmosphere of sun and stars in a large amount, is
a) H₂ b) H
c) H⁺ d) H⁻
59. Cesium and Francium are liquids above
a) 10°C b) 15°C
c) 20°C d) 30°C

60. In an aqueous solution the hydrides of alkali metals are
a) Stable b) Unstable
c) No change d) None of these
61. As the atomic number of the halogen increases, the halogens
a) Lose their outermost electrons less easily
b) Become less dense
c) Becomes lighter in color
d) Gain electrons less easily
62. The electron affinity of fluorine is
a) -348.8 kJ/mol b) -337 kJ/mol
c) 337 kJ/mol d) 348.8 kJ/mol
63. Which ionic halides have high m.p and b.p?
a) Fluoride b) Chloride
c) Bromide d) Iodide
64. Which gas is used in the making of tungsten bulb filaments?
a) H_2 b) N_2
c) O_2 d) CO_2
65. The ionic halides in order of decreasing m.p and b.p can be arranged as
a) Iodide>bromide>chloride>fluoride
b) Bromide>chloride>fluoride>iodide
c) Chloride>bromide>iodide>fluoride
d) Fluoride>chloride>bromide>iodide
66. A hydride ion and helium atom has same number of
a) Protons b) Neutrons
c) Electrons d) All of these
67. Ionic hydrides are also called
a) Saline hydrides b) Salt like hydrides
c) Both a & b d) None of these
68. The hydrides which act as powerful reducing agents are
a) Ionic b) Covalent
c) Interstitial d) Complex
69. The hydrides which are non stoichiometric in nature are
a) Ionic b) Covalent
c) Interstitial d) Complex
70. Which one is the example of complex hydride?
a) PH_3 b) NaH
c) LaH_3 d) NaBH_4
71. The adsorption of hydrogen by platinum is known as
a) Hydrogenation b) Dehydrogenation
c) Occlusion d) Substitution

72. From left to right in a periodic table charge to mass ratio increases therefore the hydration energy
a) Decreases b) Increases
c) Remains constant d) None of these
73. _____ elements have been discovered so far.
a) 100 b) 110
c) 120 d) 150
74. _____ classified the then known elements into metals, non metals and their derivatives.
a) Dobreiner b) Al – Razi
c) Newlands d) Mendeleev
75. Dobreiner's work led to the law of triads which states that _____
a) Atomic weight of any one element was found to be approximately the mean of the other two elements of triad.
b) Atomic weight of the middle element was found to be approximately the mean of the other two elements of a triad.
c) Atomic number of any one element was found to be approximately the mean of the other two elements of a triad.
d) Atomic number of the middle element was found to be approximately the mean of the other two elements of a triad.
76. The law of octaves was given by _____
a) Dobreiner b) Al – Razi
c) Newlands d) None of these
77. Law of octave states that _____
a) The properties of every 6th element from the given one were similar to the first.
b) The properties of every 9th element from the given one were similar to the first.
c) The properties of every 8th element from the given one were similar to the first.
d) The properties of every 7th element from the given one were similar to the second.
78. Mendeleev's Periodic Table was based on _____
a) Atomic number b) Atomic mass
c) Atomic volume d) Electronic configuration
79. Moseley's work led to the periodic law, which states that _____
a) The number of the electrons in the 1st energy level increases as the atomic number increases.
b) The properties of the elements are a periodic function of their atomic mass.
c) The x – rays spectra of the elements are more complex than the optical spectra.
d) The properties of elements are the periodic function of their atomic number.
80. A pair of elements in the same family in the periodic table classification is _____
a) Chlorine and carbon
b) Calcium and aluminum
c) Nitrogen and neon
d) Sodium and potassium
81. In the period, the elements are arranged in strict sequence in order of _____
a) Increasing charges in the nucleus.
b) Increasing atomic weights.
c) Increasing number of electrons in valence shell.
d) Increasing valency.

82. Uranium is a member of
a) s – block b) p – block
c) d – block d) f – block
83. How many ionization energies can carbon have?
a) 1 b) 2
c) 4 d) 6
84. Which ion has the maximum polarization power?
a) Li^+ b) Mg^{2+}
c) Al^{3+} d) O^{2-}
85. Which of the following halides is not oxidized by MnO_2 ?
a) F b) Cl^-
c) Br d) I
86. The process requiring absorption of energy is
a) $\text{F} \rightarrow \text{F}^-$ b) $\text{Cl} \rightarrow \text{Cl}^-$
c) $\text{O} \rightarrow \text{O}^{2-}$ d) $\text{H} \rightarrow \text{H}^-$
87. Most of the known elements are metals of _____ of periodic table.
a) d – block b) p – block
c) III – group d) Zero block
88. The volume in cubic centimeters occupied by one gram atom of the element is called
a) Atomic volume b) Atomic weight
c) Mass number d) None
89. The lowest ionization energies are found in the
a) Inert gases b) Alkali metals
c) Transition elements d) Halogens
90. The unit of ionization energy is _____
a) Joule b) Calorie
c) Electron volt d) None

I.I.T.Foundation - XI Chemistry MCQ #4

Time: 45 min Student's Name: _____

Full Marks: 90

Chemical Bonding

I. MCQ - Choose Appropriate Alternative

1. The energy required to break a chemical bond to form neutral atoms is called _____.

(Ionization Potential, Electron Affinity, Bond Energy)

2. The chemical bond present in H-Cl is _____.

(Non Polar, Polar Covalent, Electrovalent)

3. A polar covalent bond is formed between two atoms when the difference between their E.N values is _____.

(Equal to 1.7, less than 1.7, More than 1.7)

4. The most polar covalent bond out of the following is _____.

(H-Cl, H-F, H-I)

5. _____ bond is one in which an electron has been completely transferred from one atom to another.

(Ionic, Covalent, co-ordinate)

6. _____ bond is one in which an electron pair is shared equally between the two atoms.

(Ionic, Covalent, Co-ordinate)

7. Bond angle in the molecule of CH₄ is of _____.

(120°, 109.5°, 180°)

8. A molecule of CO₂ has _____ structure.

9. The sigma bond is _____ than pi bond.

(Weaker, Stronger, Unstable)

10. The sp³ orbitals are _____ in shape.

(Tetrahedral, Trigonal, Diagonal)

11. The shape of CH₄ molecule is _____.

(Tetrahedral, Trigonal, Diagonal)

12. The bond in Cl_2 is _____.

(Non polar, Polar, Electrovalent)

13. Water is _____ molecule.

(None polar, Polar, Electrovalent)

14. Covalent bonds in which electron pair are shared equally between the two atoms is called _____ covalent bond.

(Non polar, Polar, Co-ordinate)

15. Each carbon atom in CH_4 is _____ hybridized.

(sp^3 , sp^2 , sp)

16. Each carbon atom in C_2H_4 is _____ hybridized.

(sp^3 , sp^2 , sp)

17. Each carbon atom in C_2H_2 is _____ hybridized.

(sp^3 , sp^2 , sp)

18. Oxygen atom in H_2O has _____ unshared electron pair.

(One, two, three)

19. Nitrogen atom in NH_3 has _____ unshared electron pair.

(One, two, three)

20. The cloud of charge that surrounds two or more nuclei is called _____ orbital.

(Atomic, Molecular, Hybrid)

21. A substance, which is highly attracted by a magnetic field, is called _____.

(Electromagnetic, Paramagnetic, Diamagnetic)

22. HF exists in liquid due to _____.

(Vander Waal Forces, Hydrogen bond, covalent Bond)

23. Best hydrogen bonding is found in _____

(HF , HCl , HI)

24. Shape of CCl_4 molecule is _____.

(tetrahedral, Trigonal, Diagonal)

25. _____ bond is formed due to linear overlap.

(Sigma bond, Pi bond, Hydrogen bond)

26. _____ is defined as the quantity of energy required to break one mole of covalent in gaseous state.

(Bond energy, Ionization energy, Energy of Activation)

27. Repulsive force between electron pair in a molecule is maximum when it has an angle of _____.

(120°, 109.5°, 180°)

28. Repulsive force between electron pair in a molecule is maximum when it has an angle of _____.

(120°, 109.5°, 180°)

29. The sum of total number of electrons pairs (bonding and lone pairs) is called _____.

(Atomic Number, Avogadro's Number, Steric Number)

30. Shape of _____ molecule is tetrahedral.

(BaCl₂, BF₃, NH₃)

II. Fill in the Blank

1. A bond formed due to transference of electron is called _____.

2. A bond formed due to sharing of electron is called _____.

3. Sigma bond is _____ than pi bond.

4. The shape of methane molecule is _____.

5. One s and 3p orbitals overlap to produce four _____ hybrid orbitals.

6. Ethene, C₂H₄ is an example of _____ hybridization.

7. Water molecule has _____ structure.

8. Water molecules are inter-linked with one another due to _____.

9. Polarity of the molecule is due to the difference of _____ between the two bonded atoms.

10. A chemical bond formed between two different atoms by mutual sharing of electron is termed as _____.

11. A chemical bond formed between two similar atoms by mutual sharing of electrons is known as _____.

12. The difference between the Electronegativity values of the two atoms forming covalent bond must be _____ than 1.7.

13. When two orbitals of different atoms by hybridize with each other having their axes in the same straight lines, the bond formed is termed as _____.
14. _____ bond is formed when p-orbitals of the two atoms with their axes parallel to each other overlap with each other.
15. Melting and boiling point of ionic compounds are usually _____ than that of covalent compounds.
16. Non polar compounds are usually _____ in non polar solvent.
17. The nitrogen in NH_3 is _____ hybridized.
18. A hybrid orbital is called _____ orbital.
19. Since dipole moment of CS_2 is zero, it is a _____ molecule.
20. A bond formed due to the electrostatic forces of attraction between the oppositely charged ions is called _____ bond.
21. The ionic bond is formed between the atoms with low ionization potential and high _____.
22. A bond formed by the sharing of an electron pair contributed by one atom only is called a _____ bond.
23. A co-ordinate covalent bond is also known as _____ bond.
24. Polar covalent bond is _____ than a non polar covalent bond.
25. H-F bond is _____ than H-Br bond.
26. The SI unit of dipole moment is _____.
27. Commonly used unit of dipole moment is _____.
28. Dipole moment of non-polar compound is _____ D.
29. The reactions of ionic compounds are usually very _____.
30. Covalent compounds are generally _____ in nature.
31. Ionic compounds are generally _____ in nature.
32. A covalent bond is represented by a _____.
33. A co-ordinate covalent bond is represented by an _____.
34. The covalent bond between H-F is called _____ covalent bond.
35. The power of an atom to attract a shared pair of electron itself is called _____ of that atom.
36. $m = d \times e$ represents _____.
37. CO_2 and SO_2 molecules have _____ polar bonds.

38. NH_3 molecule has _____ polar bonds.
39. A double bond has _____ bond energy than a single bond.
40. An orbital which surrounds a single nucleus is called _____ orbital.
41. An orbital which surrounds two or more atomic nuclei is called _____ orbital.
42. A molecular orbital, which is of lower energy than the atomic orbitals from which it is derived, is known as _____ orbital.
43. A molecular orbital, which has higher energy than the atomic orbitals from which it is derived, is known as _____ orbital.
44. Orbitals formed after hybridization are called _____ orbitals.
45. Bond angle in sp^3 hybridization is of _____.
46. Bond angle in sp^2 hybridization is of _____.
47. Bond angle in sp hybridization is of _____.
48. sp^3 hybridization is also known as _____.
49. sp^2 hybridization is also known as _____.
50. sp hybridization is also known as _____.
51. A pair of electrons residing on the central atom and which is not used in bonding is called a _____.
52. The sum of total number of electron pairs (bonding and lone pairs) is called _____ number.
53. _____ bond is usually expressed by dotted line.
54. Water molecule has dipole moment because of its _____ structure.
55. CO_2 is non polar because of its _____ structure.
56. Overlapping in _____ bond is perfect.
57. Overlapping in _____ bond is not perfect.
58. H-H bond is _____ than H-Cl bond.
59. _____ hybrid orbitals are not co-planar.
60. Covalent bond in Cl_2 molecule is _____.

I.I.T.Foundation - XI Chemistry MCQ #5

Time: 45 min Student's Name: _____

Full Marks: 80

States of Matter

I. MCQ - Choose Appropriate Alternative

1. _____ was the first scientist who expressed a relation between pressure and the volume of a gas.

(Charles, Boyle, Avogadro)

2. If the pressure upon a gas confined in a vessel varies, the temperature remaining same, the volume will _____.

(Vary directly as the pressure, Vary inversely as the temperature, Vary inversely as the pressure)

3. The statement concerning the relation of temperature to the volume of a gas under fixed pressure was first synthesized by _____.

(Boyle, Charles, Avogadro)

4. Absolute Zero is _____.

(273°C, -273°C, -273°K)

5. Gases intermix to form _____.

(Homogeneous mixture, Heterogeneous mixture, compound)

6. Water can exist in _____ physical states at a certain condition of temperature pressure.

(One, Two, three)

7. The temperature at which the volume of a gas theoretically becomes zero is called _____.

(Transition temperature, Critical Temperature, Absolute Zero)

8. Gases deviate from ideal behaviour at _____ pressure and _____ temperature.

(Low, High, Normal)

9. Very low temperature can be produced by the _____ of gases.

(Expansion, Contraction, Compression)

10. Boiling point of a liquid _____ with increase in pressure.

(increases, decreases, remains same)

11. 273°K = _____

(100°C, 273°C, 0°C)

12. -273°C is equal to _____.

(0°K , 273°K , 100°K)

13. Evaporation takes place at _____.

(All temperatures, At constant temperature, at 100°C)

14. _____ is the temperature at which the vapour pressure of a liquid becomes equal to atmospheric pressure.

15. The freezing point of water in Fahrenheit scale is _____.

(0°F , 32°F , 212°F)

16. All gases change to solid before reaching to _____.

(-100°C , 0°C , -273°C)

17. Pressure of the gas is due _____ of the molecules on the wall of the vessel.

(Collisionns, Attraction, Repulsion)

18. Boiling point of water in absolute scale is _____.

(212°K , 100°K , 373°K)

19. Boyle's Law relates _____.

(Pressure and volume, Temperature and volume, Pressure and temperature)

20. Charles Law deals with _____ relationship.

(temperature and volume, pressure and volume, temperature and pressure)

21. Effusion is the escape of gas through _____.

(A small pin hole, Semi permeable membrane, porous container)

22. The expression $P = P_1 + P_2 + P_3$ represents _____ mathematically.

(Graham's Law, Avogadro's Law, Dalton's law of partial Pressure)

23. According to _____ equal volumes of all gases at the same temperature and pressure contain equal number of molecules.

(Graham's Law, Avogadro's Law, Dalton's Law)

24. The boiling point of pure water is _____.

(32°C , 100°F , 373°K)

25. The internal resistance of a liquid to flow is called _____.

(Surface tension, Capillary action, Viscosity)

26. The existence of different crystals forms of the same substance is called _____.

(Isomorphism, Polymorphism, Isotopes)

27. Rate of Evaporation _____ on increasing temperature.

(Increases, Decreases, Remains same)

28. The temperature at which more than one crystalline forms of a substance coexist is called the _____.

(Critical Temperature, Transition Temperature, Absolute Temperature)

29. The gases which strictly obey the gas laws are called _____.

(Ideal gases, Permanent gases, Absolute gases)

30. Lighter gas diffuse _____ than the heavier gases.

(More readily, Less readily, Very slowly)

II. Fill in the Blank

1. The intermixing of gases or liquids in a container irrespective of their densities, is called _____.

2. At constant temperature, if the pressure of a given mass of a gas is decreased, its volume will _____.

3. A volume of _____ dm^3 will hold 128 gms of SO_2 .

4. At constant temperature of a given mass of a gas, the product of its _____ and _____ is constant.

5. The rates of diffusion of gases are _____ proportional to the square root of their densities.

6. Gases deviate from ideal behaviour more markedly at high _____.

7. Liquid diffuse _____ than gases.

8. An imaginary line passing through the centre of a crystal is called _____.

9. The temperature at which more than one crystalline forms of a substance coexist in equilibrium is called _____.

10. Two or more substances crystallizing in the same form is called _____.

11. The existence of solid substances in more than one crystalline form is known as _____.

12. Rate of diffusion of gases is _____ as compared to liquids.

13. Boiling point of a liquid _____ with the pressure.

14. Mercury in a glass tube forms _____ curvature.

15. Gases can be compressed to _____ extent.

16. Viscosity of a liquid _____ with the increase of temperature.
17. Surface tension of water _____ by adding soap solution into it.
18. The internal resistance to the flow of a liquid is called _____.
19. The rise or the fall of a liquid in a capillary tube is called _____.
20. Matter exists in _____ states.
21. The freezing point of water in Fahrenheit scale is _____.
22. Boiling point of water is _____ °K.
23. SI unit for measurement of pressure is _____.
24. The value of gas law constant $R =$ _____ $\text{dm}^3 \text{ atm}/^\circ\text{K}/\text{mole}$.
25. The absolute Zero is equal to _____.
26. If P is plotted against $1/V$ at constant temperature a _____ is obtained.
27. Gases _____ in heating.
28. The pressure of air _____ at higher altitude.
29. Standard temperature means _____.
30. Standard pressure means _____.
31. Cooling is caused by _____ of gases.
32. Rate of diffusion of O_2 is _____ times more than H_2 .
33. H_2O has _____ viscosity than CH_3OH .
34. Mercury does not wet the glass surface due to its higher _____.
35. Surface tension of mercury is _____ than water.
36. Viscosity can be easily measured by an instrument called _____.
37. The pressure exerted by the vapours when these vapours are in equilibrium with the liquid is called _____.
38. Vapour pressure _____ at high temperature.
39. Boyle's Law and Charles Law can be combined into the mathematical expression _____.
40. Equal volumes of all gases at the same temperature and pressure contain _____ number of molecules.
41. The average Kinetic energy of a gas is proportional to its _____ temperature.
42. Kinetic equation may be mathematically written as _____.

43. The temperature at which two crystalline forms of a substance can coexist in equilibrium is called _____.
44. Lighter gases diffuse _____ than heavier gases.
45. Rain drops are _____ in shape.
46. Due to surface tension, the surface area of the liquid is _____.
47. Water _____ in the capillary tube.
48. Viscosity of a solution at 10°C is _____ than at 20°C .
49. Shape of NaCl crystal is _____.
50. Pressure of a dry gas is _____ than the pressure of a moist gas.

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I.I.T.Foundation - XI Chemistry MCQ #6

Time: 45 min Student's Name: _____

Full Marks: 60

Chemical Thermodynamics

I. MCQ - Choose Appropriate Alternative

1. The quantity of heat evolved or absorbed during a chemical reaction is called _____.

(Heat of Reaction, Heat of Formation, Heat of Combination)

2. An endothermic reaction is one, which occurs _____.

(With evolution of heat, With absorption of Heat, In forward Direction)

3. An exothermic reaction is one during which _____.

(Heat is liberated, Heat is absorbed, no change of heat occurs)

4. The equation $C + O_2 \rightarrow CO_2$ $\Delta H = -408\text{KJ}$ represents _____ reaction.

(Endothermic, Exothermic, Reversible)

5. The equation $N_2 + O_2 \rightarrow 2NO$ $\Delta H = 180\text{KJ}$ represents _____ reaction.

(Endothermic, Exothermic, Irreversible)

6. Thermo-chemistry deals with _____.

(Thermal Chemistry, Mechanical Energy, Potential Energy)

7. Enthalpy is _____.

(Heat content, Internal energy, Potential Energy)

8. Hess's Law is also known as _____.

(Law of conservation of Mass, Law of conservation of Energy, Law of Mass Action)

9. Any thing under examination in the Laboratory is called _____.

(Reactant, System, Electrolyte)

10. The environment in which the system is studied in the laboratory is called _____.

(Conditions, Surroundings, State)

11. When the bonds being broken are more than those being formed in a chemical reaction, then ΔH will be _____.

(Positive, Negative, Zero)

12. When the bond being formed are more than those being broken in a chemical reaction, then the ΔH will be _____.

(Positive, Negative, Zero)

13. The enthalpy change when a reaction is completed in single step will be _____ as compared to that when it is completed in more than one steps.

(Equal to, Partially different from, Entirely different from)

14. The enthalpy of a system is represent by _____.

(H, ΔH , ΔE)

15. The factor $E + PV$ is known as _____.

(Heat content, Change in Enthalpy, Work done)

16. Heat of formation is represented by _____.

(Δf , ΔH_f , H_f)

17. The heat absorbed by the system at constant _____ is completely utilize to increase the internal energy of the system.

(Volume, Pressure, Temperature)

18. Heat change at constant _____ from initial to final state is simply equal to the change in enthalpy.

(Volume, Pressure, Temperature)

19. A system, which exchange both energy and energy with the surrounding, is _____ system.

(Open, Closed, Isolated)

20. A system, which only exchange energy with the surrounding but not the matter, is _____ system.

(Open, Closed, Isolated)

II. Fill in the Blank

1. The branch of Chemistry, which deals with the heat changes that take place during chemical reaction, is called _____.

2. The branch of science which deals with energy changes accompanying physical and chemical transformation is called _____.

3. The amount of heat evolved or absorbed in a chemical reaction is called _____.

4. Such reactions in which heat is evolved are called _____ reactions.

5. Such reactions in which heat is absorbed are called _____ reactions.

6. In exothermic reactions, heat evolved is given by _____ sign of ΔH .

7. In endothermic reactions heat absorbed is given by _____ sign of ΔH .
8. The total heat change in a reaction is the same whether it takes place in one or several steps.
9. The first law of thermodynamics is also known as _____.
10. The part of universe under observation is called _____.
11. The system plus its surrounding is called _____.
12. Such properties, which give description of a system at a particular moment, is called _____.
13. The term $E + PV$ is called _____.
14. ΔH represents change in _____.
15. The temperature of water is raised up when sulphuric acid is added to it. This is an _____ reaction.
16. The characteristic properties of a system which is independent of amount of material concerned is called _____ properties.
17. The characteristic properties of a system which depend on amount of substance present in it is called _____ properties.
18. Density, pressure and temperature are the examples of _____ properties.
19. Mole numbers and enthalpy are the examples of _____ properties.
20. A system, which exchange both energy and matter with its surrounding, is called _____ system.
21. A system, which only exchange energy with the surrounding but not matter is, called _____ system.
22. A system which neither exchange energy nor matter with its surrounding is called _____ system.
23. A system is _____ if it contains only one phase.
24. A system is _____ if it contains more than one phase.
25. 1 kilojoule is equal to _____ joules.
26. 1 Calorie is equal to _____ joules.
27. 1 kilo calorie is equal to _____ joules.
28. The work done (w) is mathematically denoted by _____.
29. The change in enthalpy is denoted by _____.
30. _____ law is used in calculating heat of reaction.
31. _____ is defined as the change in enthalpy when one gram mole of a compound is produced from its element.
32. Heat of formation is denoted by _____.

33. When the work is done on the system by the surrounding the sign of work done (w) is _____.
34. When the work is done by the system on surrounding the sign of work done is _____.
35. First law of Thermodynamics is mathematically represented as _____.
36. Standard enthalpies are measured at _____.
37. Hess's Law is employed to calculate _____ of a chemical reaction.
38. Heat absorbed by the system at constant volume is completely utilize to increase the _____ of the system.
39. Heat change at constant pressure from initial to final state of the system is simply equal to the _____.
40. SI unit of measurement of heat change is _____.

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I.I.T.Foundation - XI Chemistry MCQ #7

Time: 45 min Student's Name: _____

Full Marks: 60

Chemical Equilibrium

I. MCQ - Choose Appropriate Alternative

1. At equilibrium the rate of forward reaction and the rate of reverse reaction are _____.

(Equal, Changing, Different)

2. Such reactions, which proceed to forward direction only and are completed after sometime are called _____ reaction.

(Irreversible, Reversible, Molecular)

3. Such reactions, which proceed to both the direction and are never completed, are called _____ reaction.

(Irreversible, Reversible, Molecular)

4. The rate of chemical reaction is directly proportional to the product of the molar concentration of _____.

(Reactants, Products, Both reactants and products)

5. "If a system in equilibrium is subjected to a stress, the equilibrium shifts in a direction to minimize or undo the effect of this stress. This principle is known as _____.

(Le-Chatelier's Principle, Gay Lussac's Principle, Avogadro's Principle)

6. A very large value of K_c indicates that reactants are _____.

(very stable, unstable, moderately stable)

7. A very low value of K_c indicates that reactants are _____.

(very stable, very unstable, moderately stable)

8. The equilibrium in which reactants and products are in single phase is called _____.

(Homogenous Equilibrium, Heterogenous Equilibrium, Dynamic Equilibrium)

9. The equilibrium in which reactants and products are in more than one phases are called _____.

(Homogenous Equilibrium, Heterogenous Equilibrium, Dynamic Equilibrium)

10. Chemical Equilibrium is _____ equilibrium.

(Dynamic, Static, Heterogeneous)

11. In exothermic reaction, lowering of temperature will shift the equilibrium to _____.

(right, left, equally on both the direction)

12. In endothermic reaction, lowering of temperature will shift the equilibrium to _____.

(right, left, equally on both the direction)

13. A catalyst _____ the energy of activation.

(increases, decreases, has no effect on)

14. At equilibrium point _____.

(forward reaction is increased, backward reaction is increased, forward and backward reactions become equal)

15. NH_3 is prepared by the reaction $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$; $\Delta H = -21.9 \text{ Kcal}$. The maximum yield of NH_3 is obtained _____.

(At low temperature and high pressure, at high temperature and low pressure, at high temperature and high pressure)

16. When a high pressure is applied to the following reversible process: $\text{N}_2 + \text{O}_2 \rightarrow 2\text{NO}$ The equilibrium will _____

(shift to the forward direction, shift to the backward direction, not change)

17. The value of K_c _____ upon the initial concentration of the reaction.

(depends, partially depends, does not depend)

18. While writing the K_c expression, the concentration of _____ are taken in the numerator.

19. Solubility product constant is denoted by _____.

(K_c , K_{sp} , K_r)

20. "The degree of ionization of an electrolyte is suppressed by the addition of another electrolyte containing a common ion." This phenomenon is called _____.

(Solubility Product, Common Ion Effect, Le-Chatelier's Principle)

II. Fill in the Blank

1. The reactions, which proceed in both the directions, are called _____ reactions.

2. The reactions, which proceed to one direction only, are called _____ reactions.

3. Reversible reactions are _____ completed.

4. Irreversible reactions are _____ after some time.

5. A reversible reaction is said to be in _____ when the rate of forward reaction becomes equal to the rate of backward reaction.
6. The concentrations of reactants and products are _____ at equilibrium point.
7. The value of K_c depends upon the _____ of the reactants.
8. A increase of the value of K_c tends to move the reaction to the _____ direction.
9. A decrease of the value of K_c tends to move the reaction to the _____ direction.
10. An increase in the concentration of the reactants will move the reaction to the _____ direction.
11. A decrease in the concentration of the reactants will move the reaction to the _____ direction.
12. Equilibrium constant is denoted by _____.
13. When the equilibrium constant value is very _____, we can conclude that the forward reaction is almost completed.
14. When equilibrium constant value is very _____ we can conclude that forward reaction will occur to very little extent.
15. According to _____ principle, if system in equilibrium is subjected to a stress, the equilibrium shifts in a direction to minimize or undo the effect of the stress.
16. In exothermic reaction, the _____ of temperature favour the forward rate of reaction.
17. In endothermic reactions, the _____ of temperature favour the forward rate of reaction.
18. A _____ is a substance which effects the rate of reaction but remains unaltered at the end of the reaction.
19. A catalyst increases the velocity of the reaction by decreasing the _____.
20. The suppression of degree of ionization of a sparingly soluble weak electrolyte by the addition of a strong electrolyte containing an ion in common is called _____.
21. _____ is purified in industries by Common Ion Effect.
22. A reaction moves to the left when the concentrations of the products are _____.
23. A reaction moves to the right when the concentrations of the products are _____.
24. Increase in pressure will move the reaction in the direction of _____ volume.
25. Decrease in pressure will move the reaction in the direction of _____ volume.
26. An increase of temperature favours the formation of products in case of _____ reaction.
27. A decrease of temperature favours the formation of products in case of _____ reaction.
28. Heating moves an endothermic reaction to the _____.

29. Cooling move an exothermic reaction to the _____.
30. The product of ionic concentration in a saturated solution is called _____ constant.
31. When HCl is added to NaCl, the concentration of _____ ion is increased.
32. Chemical reaction involving the substances in more than one phases are called _____.
33. The formation of NH_3 is exothermic process hence _____ temperature will favour the formation of NH_3 .
34. The formation of NO from N_2 and O_2 is endothermic process hence _____ temperature will favour the formation of NO.
35. Chemical Equilibrium is _____ equilibrium.
36. Molar concentration is also called _____.
37. The rate at which a substance takes part in a chemical reaction depends upon its _____.
38. _____ principle is applied to all reversible reaction.
39. A common ion _____ the solubility of the salt.
40. Number of moles present per dm^3 of a substance is called _____.

I.I.T.Foundation - XI Chemistry MCQ #8

Time: 45 min Student's Name:

Full Marks: 60

s-Block Elements

I. MCQ - Choose Appropriate Alternative

- The oxides of beryllium are.
(A) Acidic (B) Basic
(C) Ba^{+2} (D) Mg^{+2}
- Which ion will have the maximum value of heat of hydration?
(A) Na^+ (B) Cs^+
(C) Ba^{+2} (D) Mg^{+2}
- Which one of the following is not an alkali metal?
(A) Sodium sulphate (B) Potassium sulphate
(C) Zinc sulphate (D) Barium sulphate
- The element cesium bears resemblance with.
(A) Ca (B) Cr
(C) Both of the above (D) None of the above
- Chile saltpeter had the chemical formula
(A) NaNO_3 (B) KNO_3
(C) $\text{Na}_2\text{B}_4\text{O}_7$ (D) $\text{Na}_2\text{CO}_3\cdot\text{H}_2\text{O}$
- The ore $\text{CaSO}_4\cdot 2\text{H}_2\text{O}$ has the general name.
(A) Gypsum (B) Dolomite
(C) Calcite (D) Epsom salt
- Down's cell is used to prepare.
(A) Sodium carbonate
(B) Sodium bicarbonate
(C) Sodium metal
(D) Sodium hydroxide
- Which element is deposited at the cathode during the electrolysis of brine in Nelson's cell?
(A) H_2 (B) Na
(C) Cl_2 (D) O_2
- Ionic radius of potassium is.
(A) 60 pm (B) 133 pm
(C) 99 pm (D) 169 pm
- Among alkaline Earth Metals, the highest heat of hydration is of.
(A) Be (B) Sr
(C) Rb (D) Cs
- The chemical formula of sylvite is.
(A) $\text{Na}_2\text{CO}_3\cdot\text{H}_2\text{O}$ (B) KCl
(C) $\text{KCl}\cdot\text{MgCl}_2\cdot 6\text{H}_2\text{O}$ (D) NaCl

12. The chemical formula of Alumite (Alum stone) is.
(A) $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$
(B) KCl
(C) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
(D) $\text{K}_2\text{SO}_4 \cdot \text{Al}(\text{SO}_4)_3 \cdot 2\text{Al}(\text{OH})_3$
13. Among alkali metals the lowest atomic number is of.
(A) Rb (B) K
(C) Sr (D) Li
14. Due to the high reactivity nature of the alkali metals, they are found in.
(A) Free in nature
(B) Bounded with other elements
(C) Not free in nature
(D) All of the above
15. Magnesium is an essential constituent of.
(A) Storaata (B) Plants
(C) Chlorophyll (C) None of the above
16. Which of the alkali earth metal has radioactive nature.
(A) Be (B) Rb
(C) Both of the above (D) Na
17. Calcium Phosphate $\text{Ca}_3(\text{PO}_4)_2$ and calcium fluoride CaF_2 are essential part of living organisms.
(A) Bones, egg shells (B) teeth
(C) Sea-shells (D) All of the above
18. Dolomite is a compound of which elements.
(A) Be (B) Mg
(C) Ca (D) Ba
19. The melting point and boiling point of which alkaline earth metal is high.
(A) Sr (B) Mg
(C) Be (D) Na
20. The super oxides are formed by the elements.
(A) K, Rb, Cs (B) K, Na, Cs,
(C) K, Li, Na (D) None of the above
21. Potassium, rubidium and caesium are so highly reactive that they react with ice even at .
(A) -100°C (B) -200°C
(C) -50°C (D) -0°C
22. Among the alkaline earth metal which has least reactivity even upto 800°C
(A) Ba (B) Cs
(C) Li (D) Be
23. Plaster of paris is formed after heating upto 100°C
(A) $\text{Mg}(\text{NO}_3)_2$ (B) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (gypsum)
(C) NaNO_2 (D) LiNO_3

24. The root system of several plants have been greatly enlarged by the application of.
A) Sulphur B) Gypsum
C) Both of the above D) None of the above
25. When deficiency of calcium exists various substances are accumulated in plants in harmful concentration which are.
(A) Lime
(B) Aluminium
(C) Aluminium and Manganese
(D) None of the above
26. Which alkali metal behave different by from others?
(A) Mg (B) Na
(C) Rb (D) Li
27. Spodumene, petalite, halite, natron, alinite are the common minerals of.
A) Alkali metals B) Alkaline earth metals
C) Both of the above D) Li
28. Sodium is prepared by the electrolysis of.
(A) Simple NaCl in Down's cell
(B) Molten NaCl in Down's cell
(C) Molten sodium hydroxide in down's cell
(D) None of the above
29. Lime is used in.
(A) Glass industry
(B) Glass and paper industries
(C) Paper industries
(D) None of the above
30. The elements which are very abundant in earth crust are_____
a) Si & Al b) Ca & Mg
c) B & Al d) All
31. The oxides of Be are _____
a) Acidic b) Basic
c) Amphoteric d) None
32. Carbonates of lithium are not stable like that of sodium due to _____
a) Low electronegativity
b) Low electropositivity
c) Low charge density d) Not know yet
33. Which one of the following is not an alkali metal?
a) Francium b) Caesium
c) Rubidium d) Radium
34. Which of the following sulphates is not soluble in water?
a) Sodium sulphate b) Potassium sulphate
c) Zinc sulphate d) Barium sulphate
35. The ore $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ has the general name_____
a) Gypsum b) Dolomite
c) Sodium metal d) Sodium hydroxide

36. Crystals of $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ when exposed to air, _____
a) Lose water and remain solid
b) Gain water and remain solid
c) Gain water and become liquid
d) Remains unchanged.
37. The deliquescence is a process in which a solid _____
a) Absorbs moisture and remains solid
b) Absorbs moisture and turns to liquid form
c) Loses water of crystallization
d) Increases the number of water of crystallization
38. In diaphragm cell, level of brine in anode compartment is kept slightly higher which prevents
a) Hydroxide ions to reach anode
b) Chlorine gas to mix
c) Anode to decay d) All
39. Alkali metals form bonds
a) Ionic b) Covalent
c) Metallic d) Co-ordinate covalent
40. The alkali metals, which have radioactive isotopes
a) Li b) Na
c) K d) K and Rb
41. Halite is the mineral of
a) Sodium b) Potassium
c) Lithium d) Cesium
42. $\text{Na}_2\text{SO}_3 \cdot 10\text{H}_2\text{O}$ is the mineral of sodium and is called
a) Spodumene b) Halite
c) Natron d) Sylvite
43. Which one of the following is dolomite?
a) MgCO_3 b) $\text{MgCO}_3 \cdot \text{CaCO}_3$
c) CaCO_3 d) BaSO_4
44. The high electrical conductivity of alkali metals is due to the
a) Free motion of valence electrons
b) High I.P
c) Lesser atomic radii
d) None of these
45. Sodium imparts color to Bunsen flame
a) Green b) Violet
c) Blue d) Yellow
46. All alkaline earth metals are white except
a) Mg b) Ca
c) Be d) Sr

47. Metals, which are higher than water, are
a) Alkaline earth metals
b) Coinage metals
c) Alkali metals
d) All of these
48. Except lithium, the hydroxides of all alkali metals are
a) Strongly acidic b) Strongly basic
c) Weakly basic d) All of these
49. The carbonates and phosphates of which elements are insoluble in water
a) Na and K b) Na and Be
c) Li and Mg d) All of these
50. All alkaline earth metals react with water at room temperature to release hydrogen and give basic solutions except
a) Be and Ca b) Be and Mg
c) Ca and Mg d) Mg and Sr
51. Lithium only forms normal oxides when burnt on air but when sodium is burnt in air it forms
a) Normal oxides b) Sub oxides
c) Peroxides d) Super oxides
52. The super oxides of alkali metals are generally represented by
a) M_2O b) M_2O_2
c) MO_2 d) M_2O_3
53. The nitrates of which group decompose on heating with the formation of nitrites and evolution of oxygen
a) IA b) II A
c) III A d) IV A
54. A small amount of calcium chloride or mixture of KCl and KF is added to NaCl in Down's cell
a) To make it good conductor
b) To decrease the m.p of NaCl
c) To increase the ionization of NaCl d) To decrease the ionization of NaCl
55. Liquid sodium in the Down's cell is collected at a temperature of
a) 700°C b) 600°C
c) 500°C d) 400°C
56. The product, which is obtained at cathode in the Down's cell is
a) Liquid Sodium b) Dry chlorine
c) Water d) Hydrogen
57. Which is manufactured by the electrolysis of fused sodium chloride?
a) NaOH b) NaHCO_3
c) Na d) Na_2CO_3
58. Which of the following does not conduct electricity?
a) Boron b) Gallium
c) Indium d) Thallium

59. Which alkali metal is rare and found in a small amount in all – igneous rocks?
a) Li b) Na
c) K d) Fr
60. The ingredient of baking powder is
a) NaHCO_3 b) NaOH
c) Na_2CO_3 d) NaCl
61. The formula of plaster of Paris is
a) CaSO_4 b) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$
c) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ d) $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$
62. Which of the following is fluorspar?
a) CaO b) CaCO_3
c) CaF_2 d) NaOH
63. Potassium is kept in
a) Water b) Alcohol
c) Ammonia d) Kerosene oil
64. Which one has high m.p?
a) NaCl b) NaBr
c) NaI d) NaF
65. Which one of the following is most basic?
a) Al_2O_3 b) SiO_2
c) P_2O_5 d) MgO
66. Gypsum is
a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ b) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$
c) CaSO_4 d) MgSO_4
67. Which one is commonly used as a laboratory desiccator?
a) Na_2CO_3 b) NaCl
c) CaCl_2 d) NaOH
68. The radioactive alkaline earth metal is
a) Be b) Mg
c) Ra d) Ba
69. Which one of the following elements has its compounds which are diamagnetic and colourless?
a) Be b) Sr
c) Na d) All of these
70. Which metal is an important component of transistors?
a) Ag b) Au
c) Ra d) Os
71. Which impurities are present in common salt?
a) Na_2SO_4 b) CaSO_4
c) CaCl_2 d) All of these

72. K can displace Na from NaCl due to
- Greater I.P of K
 - Greater I.P of Na
 - More electropositivity of K
 - More electropositivity of Na
73. The alkali metal, which is artificially prepared
- Na
 - Rb
 - Fr
 - Cs
74. The chemical use for the production of CO_2 in the fire extinguishers is
- NaOH
 - NaCl
 - NaHCO_3 and dilute acid
 - NaHCO_3 and NaOH
75. LiCl is more soluble in organic solvents than NaCl because
- Li^{+1} has higher heat of hydration than Na^{+}
 - Li^{+1} has lower heat of hydration than Na^{+}
 - LiCl is more covalent than NaCl
 - Lattice energy of NaCl is less than that of LiCl
76. Which compound is used for uric acid treatment in human beings?
- Na_2CO_3
 - NaHCO_3
 - Li_2CO_3
 - NaNO_3
77. Which element is used in T.V picture tube?
- Na
 - K
 - Ca
 - Cs
78. Which one is used in the manufacture of chalk pencils?
- Marble
 - Gypsum
 - Epsom salt
 - Baking soda
79. Plaster of Paris has a structure
- Cubic
 - Monoclinic
 - Hexagonal
 - Orthorhombic
80. Potassium super oxide (KO_2) is used in breathing equipments for mountaineers and space craft because it absorb
- Oxygen and giving out CO_2 at the same time
 - N_2 and giving out CO_2 at the same time
 - CO_2 and giving out O_2 at the same time
 - Pollutants and giving out O_2 at the same time
81. The hydroxide, which is called milk of magnesium and is used for treatment of acidity in stomach, is
- $\text{Ca}(\text{OH})_2$
 - $\text{Mg}(\text{OH})_2$
 - $\text{Sr}(\text{OH})_2$
 - $\text{Ba}(\text{OH})_2$

82. Mg^{+2} is smaller than Na^{+1} because
a) Mg^{+2} has fewer electrons than Na^{+1}
b) Mg^{+2} has greater electron than Na^{+1}
c) Mg^{+2} has greater atomic number than Na^{+1}
d) Mg^{+2} has low I.P than Na^{+1}
83. Which of them has almost same electronegativity?
a) Be, B b) B, Al
c) Be, Al d) K, Na
84. A mixture formed by mixing one volume of slaked lime $\text{Ca}(\text{OH})_2$ with three or four volume of sand and water to form a thick paste is called
a) Lime water b) Dead water
c) Quick lime d) Milk of lime
85. If the compound has the same crystal structure and analogous formulae, they are called
a) Isotopes b) Allotropes
c) Isomers d) Isobars
86. Out of all elements of group IA, the highest heat of hydration is for _____
a) K b) Rb
c) Cs d) Li
87. The nitride ion in lithium nitride is composed of
a) 7 protons and 7 electrons
b) 10 protons and 7 electrons
c) 10 protons and 10 electrons
d) 10 protons and 5 electrons
88. When NH_3 is passed over heated sodium at 300°C , the product formed is
a) NaNH_2 b) NaNO_2
c) $\text{Na}(\text{NH}_3)_2$ d) Na_3N
89. Sodium metal can be stored under
a) Benzene b) Kerosene
c) Alcohol d) Water
90. Chile sulphur is
a) NaNO_2 b) KNO_2
c) NaNO_3 d) KNO_3

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I.I.T.Foundation - XI Chemistry MCQ #9

Time: 45 min Student's Name:

Full Marks: 60

p-Block Elements

I. MCQ - Choose Appropriate Alternative

- Which metal is used in the thermal process because of its activity.
(A) Iron (B) Copper
(C) Aluminum (D) Zinc
- Aluminum oxides is
(A) Acidic oxide (B) Basic oxide
(C) Amphoteric oxide (D) None of these
- Chemical composition of colemanite is.
(A) $\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$ (B) $\text{CaB}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$
(C) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$ (D) $\text{CaNaB}_5\text{O}_9 \cdot 8\text{H}_2\text{O}$
- Which element forms an ion with charge 3+.
(A) Beryllium (B) Aluminum
(C) Carbon (D) Silicon
- Which element among the following belongs to Group IVA of the periodic Table.
(A) Barium (B) Iodine
(C) Lead (D) Oxygen
- Boric acid cannot be used.
(A) As antiseptic in medicine
(B) For washing eyes
(C) In soda bottles
(D) For enamels and glazes
- Which of the following elements is not present abundantly in earth's crust.
(A) Silicon (B) Aluminum
(C) Sodium (D) C
- The chief Ore of aluminum is.
(A) Na_3AlF_6 (B) $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$
(C) Al_2O_3 (D) $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$
- The Group IIA of the periodic table comprises the elements.
(A) Boron, aluminum, gallium, indium and thallium.
(B) Boron gallium, thallium.
(C) Aluminum, calcium, strontium.
(D) All of the above

10. Boron is non-metallic because of
(A) Large size and higher nuclear charge
(B) Small size and higher nuclear charge
(C) Small size and smaller nuclear charge
(D) None of the above
11. The increase in the atomic size in group is
(A) Regular (B) Irregular
(C) Both (D) None of the above
12. Orthoboric Acid is a mineral of.
(A) Aluminum (B) Silicon
(C) Calcium (D) Boron
13. Aluminum is the third most abundant elements in earth crust after.
(A) Oxygen (B) Silicon
(C) None of the above (D) Both of the Both
14. Bauxite is an ore of.
(A) Aluminum (B) Boron
(C) Carbono (D) Gallium
15. Which of the elements of Group IIA are rare and only obtained as by-products.
(A) Gallium thallium
(B) Thallium indium
(C) Gallium indium
(D) Gallium thallium indium
16. Borax is the sodium salt of tetraboric acid. It is most important of all among.
(A) Borates (B) Carbonates
(C) Bicarbonates (D) None of the above
17. Borax occurs as natural deposit called tincal in the dried up lakes of.
(A) Tibet (B) California
(C) Tibet & California (D) Virginia
18. Group IV A of the periodic table comprises elements.
(A) Carbon silicon
(B) Tin, carbon, silicon
(C) Carbon, silicon, tin and lead
(D) None of the above
19. The non-metals in Group IV A are.
(A) Carbon, silicon (B) Tin and Lead
(C) All of the above (D) None of the above
20. The elements of Group IV A are character sized by a set of .
(A) Three valence shell electrons
(B) Four valence shell electrons
(C) Five valence shell electrons (D) Two valence shell electrons

21. Group IV A elements form.
(A) Super oxide (B) Oxides
(C) Dioxide (D) All of the above
22. The property of catenation among the carbon and silicon .
(A) Increase on moving down the group from carbon to lead
(B) Decrease on moving down the group from lead to carbon.
(C) Decreases on moving down the group from carbon to lead
(D) Stable on moving down the group from carbon to lead.
23. The oxides of carbon are
(A) CO and CO₂
(B) CO, CO₂ and C₃O₂ carbon sub oxide
(C) CO, CO₂, C₂C₃
(D) None of the above
24. China wares are made from a mixture of
(A) Kaolin and bone ash
(B) Kaolin and feldspar
(C) Kaolin feldspar and bone ash
(D) None of the above
25. Various oxides are used as pigments in the pigments of which element.
(A) Oxides of lead, basic lead carbonate etc.
(B) Various oxides of lead
(C) Various oxides of lead, basic lead carbonate, lead chromate
(D) Oxides of aluminum
26. Boron occurs in traces and has been found to be important for the growth of.
(A) Plants of many kinds
(B) Plants and animals
(C) Animals
(D) None of the above
27. Semiconductors conduct electricity better than.
(A) Conductors (B) Insulators
(C) Both of the above (D) None of the above
28. Oxygen is the abundant element in earth crust?
(A) Most of all
(B) 2nd in number
(C) Third most abundant
(D) 4th most abundant
29. Substance which is found in dried up lakes of Tibet and California is_____
a) Tincal b) Boric Acid
c) Calcium carbonate d) All

30. Boron is a white crystalline solid and it is _____
a) More soluble in cold water
b) More soluble in hot water
c) More soluble in water
d) Soluble only in organic solvents
31. One of the outstanding features of boron is ability to form _____
a) Molecular addition compounds
b) Molecular crystals
c) Semiconductors
d) All
32. Which of the following does not give Borax bead test?
a) Cu b) Cr
c) Ni d) Al
33. The metal which is used in thermite process because of its activity is _____
a) Iron b) Copper
c) Aluminium d) Zinc
34. Which of the following shows inert pair effect?
a) Boron b) Carbon
c) Silicon d) Tin
35. Tincal is a mineral of _____
a) Al b) Si
c) B d) C
36. Because of its ability to combine with both oxygen and nitrogen, aluminium metal is used
a) As nitrometer
b) To remove air bubbles from molten metal
c) To produce alloy
d) All
37. Silicon differ from silica by a group of _____
a) CH_3 b) $-\text{OH}$
c) OCH_3 d) O_2
38. Boron in soil has been considered essential specially for _____
a) Soil porosity
b) Proper growth of plants
c) Alkalinity of soil
d) All
39. Special feature of borate glass is that it is _____
a) Heat resistant
b) Low melting
c) Used to prepare chemical garden
d) All

40. In p – block elements, the s – electrons of outer shell of the heavier members are failed to participate in bonding, because they
- Remain paired
 - Remain unpaired
 - Are free
 - None of these
41. The tendency of the pair of S – electron to remain inert increase with the increase in
- Atomic number
 - Atomic weight
 - E.N
 - I.P
42. Boron does not easily form cations, because it has the tendency to form bond like non-metal
- Ionic bond
 - Metallic bond
 - Hydrogen bond
 - Covalent bond
43. Boron is metalloid and semiconductor like
- Be
 - K
 - Si
 - Al
44. Which element is unstable in air and is oxidized superficially in air
- Aluminum
 - Thallium
 - Gallium
 - Indium
45. Crystalline boron has structure
- Cubic
 - Monoclinic
 - Hexagonal
 - Trigonal
46. The hydrides B_2H_6 and Si_2H_6 are said to
- Ionic hydrides
 - Complex hydrides
 - Interstitial hydrides
 - Covalent hydrides
47. The compound, which is used in borax bead test for cations analysis, is
- NaOH
 - H_3BO_3
 - $Na_2B_4O_7 \cdot 10H_2O$
 - $H_2B_4O_7$
48. Orthoboric acid is weak acid because it
- Accepts OH^{-1} ion
 - Donate OH^{-1} ion
 - Accept H^{+1}
 - Donate H^{+1}
49. The aqueous solution of which acid is used for washing eyes?
- $H_2B_4O_7$
 - HCl
 - H_3BO_3
 - HBO_2
50. The process in which Bauxite is purified by dissolving it in 45% aqueous NaOH at $150^{\circ}C$ to separate insoluble iron oxide as red mud is called
- Hall's process
 - Baeyer's process
 - Arrhenius process
 - Grignard process
51. Bauxite is an oxide mineral of
- Cu
 - Ag
 - Al
 - Zn

52. AlCl_3 and GaCl_3 are covalent when anhydrous because
- They belong to group III A
 - Their ions have small size and high charge
 - They have high I.P
 - None of these
53. In the electrolysis of alumina is mixed with Cryolite (Na_3AlF_6) and fluorspar (CaF_2) in the ratio of 20 : 60 : 20. the function of the Cryolite and fluorspar is
- To decrease the fusion temperature of alumina and to make good conductor of electricity
 - To dissolve alumina
 - To dissolve sodium
 - To increase the ionization of alumina
54. Termite is a mixture of
- Iron oxide and aluminum
 - Iron oxide and copper
 - Copper oxide and aluminum
 - None of these
55. In aluminum termite process, aluminum acts as a
- Reducing agent
 - Oxidizing agent
 - A flux
 - None of these
56. Which aluminium alloy is extremely light?
- Duralumin
 - Alnico
 - Magnalium
 - Aluminium bronze
57. Cupric oxide on heating with B_2O_3 yields blue colored beads in the oxidizing flame because
- Cupric borates are white in color
 - Cupric borates are black in color
 - Cupric borates are green in color
 - Cupric borates are blue in color
58. In mordenting aluminium ions (Al^{+3}) are precipitated on the cloth as
- Al_2O_3
 - AlN
 - $\text{Al}(\text{OH})_3$
 - AlCl_3
59. Platinum metal can be dissolved in
- Hot con HCl
 - Hot con H_2SO_4
 - Hot con HNO_3
 - A mixture of Con. HCl and con HNO_3
60. Which of the following can form nitride, which react with water to give ammonia?
- Boron
 - Gallium
 - Indium
 - Thallium
61. The weak acid, which cannot be titrated with standard alkies, is
- HCl
 - H_2SO_4
 - H_3BO_3
 - All of these

62. Carbon differs from other members of its group due to smaller atomic size, higher electronegativity and the absence of
a) s – electrons b) p – electrons
c) d – electrons d) All of these
63. Aqua regia is a mixture of concentrated HNO_3 and concentrated HCl in the ratio of
a) 3 : 1 b) 1 : 3
c) 2 : 3 d) 3 : 2
64. In land storage batteries, the acid used is
a) Con HCl b) Dil HCl
c) Con H_2SO_4 d) Dil H_2SO_4
65. The dry ice is a compound of
a) Solid ice with any water
b) Solid SO_2
c) Solid CO_2
d) Solid C_6H_6
66. In the contact process for the manufacturing of H_2SO_4 , the catalyst used is
a) Cu b) Ni
c) Pt d) N_2O_5
67. The depositing layer in tin plating is
a) Cu b) Sn
c) Al d) Ni
68. Ortho boric acid on heating at 100°C yields
a) Meta boric acid
b) Pyroboric acid
c) Tetra boric acid
d) Boric anhydride acid (B_2O_3)
69. Which of the following is used in photographic film?
a) MgBr_2 b) NaCl
c) AgBr d) $\text{Na}_2\text{S}_2\text{O}_3$
70. Aluminum does not react with HNO_3 at any concentration and therefore HNO_3 is transported in aluminum containers, this is due to formation of protective layer of
a) Cupric oxide b) Ferric oxide
c) Aluminum oxide d) Aluminum nitride
71. Action of aqua regia on noble metals is due to
a) HNO_3 b) HCl
c) H_2SO_4 d) Chlorine
72. Phosgene is a poisonous gas, its chemical name is
a) Carbon dioxide b) Phosphonyl chloride
c) Carbon monoxide d) Carbonyl chloride

73. The maximum inert pair effect is shown by
a) B b) Al
c) Ga d) Tl
74. Quartz is the polymeric form of
a) $(\text{SiO}_2)_n$ b) $(\text{CO}_2)_n$
c) $(\text{CH}_2 - \text{CH}_2)_n$ d) None of these
75. If a metal is protected by an oxide layer from further attack, the metal is said to be
a) Reactive b) Active
c) Passive d) Attractive
76. Carbon reacts with metals to form
a) Hydrides b) Oxides
c) Hydroxides d) Carbide
77. The control addition of III A and IV A members in Silicon and Germanium is known as
a) Inert pair effect b) Doping
c) Litharge d) Red lead
78. P – type of semi conductor are formed by mixing Silicon or Germanium with members of
a) III A b) IV A
c) V A d) VI A
79. Litharge is chemically
a) PbO b) PbO_2
c) Pb_3O_4 d) $\text{Pb}(\text{CH}_3\text{COO})$
80. The Octet rule is not followed by
a) Boron in BCl_3 b) Oxygen in H_2O
c) Nitrogen in NH_3 d) Phosphorus in PH_3
81. Which of the following elements show oxidation state of + 3 only?
a) B b) Ga
c) In d) Tl
82. _____ of the following is not metallic in nature.
a) Boron b) Aluminum
c) Indium d) Thallium
83. The oxides of Boron are _____ in nature.
a) Acidic b) Basic
c) Neutral d) None of these
84. Orthoboric acid on heating to about 100°C loses a water molecule to form _____
a) Metaboric acid
b) Pyroboric acid
c) Metaboric and pyroboric acid
d) None of these

85. The function of Fluorspar in the electrolytic reduction of alumina dissolved in fused cryolite (Na_3AlF_6) is
- As a catalyst
 - To lower the temperature of the melt and to make the fused mixture conducting.
 - To decrease the rate of oxidation of carbon at the anode.
 - None of the above
86. Which of the following statements is correct?
- H_3PO_3 is dibasic and reducing
 - H_3PO_3 is tribasic and reducing
 - H_3PO_3 is tribasic and non – reducing
 - H_3PO_3 is dibasic and non – reducing
87. Boric acid is
- Weak monobasic Lewis acid
 - Only weak monobasic Arrhenius acid
 - Only weak monobasic Bronsted acid
 - Only weak tribasic Arrhenius acid
88. The reduction of metal oxides is sometimes accomplished by using aluminum in the
- Goldschmidt's reaction
 - Silberchemdit's reaction
 - Baeyer's reaction
 - Zilch's reaction
89. Hall's process is based on electrolysis of
- | | |
|------------|------------------|
| a) Alumina | b) Gypsum |
| c) Borax | d) None of these |
90. _____ is a better conductor of heat.
- | | |
|-------|------------------|
| a) Fe | b) Sn |
| c) Al | d) None of these |

I.I.T.Foundation - XI Chemistry MCQ #10

Time: 45 min Student's Name: _____

Full Marks: 90

Solutions

I. MCQ - Choose Appropriate Alternative

1. Molarity is the number of moles of a solute dissolved per _____.

(dm³ of a solution, dm³ of solvent, Kg of solvent)

2. Molality is defined as the number of moles of solute dissolved per _____.

(dm³ of solution, kg of solvent, kg of solute)

3. The solubility of a solute _____ with the increase of temperature.

(increases, decreases, does not alter)

4. The loss of electron during a chemical reaction is known as _____.

(Oxidation, Reduction, Neutralization)

5. The gain of electron during a chemical reaction is known as _____.

(Oxidation, Reduction, Neutralization)

6. The ions, which are attracted towards the anode, are known as _____.

(Anions, Cations, Positron).

7. The pH of a neutral solution is _____.

(1.7, 7, 14)

8. A current of one ampere flowing for one minute is equal to _____.

(One coulomb, 60 coulomb, one Faraday)

9. A substance, which does not allow electricity to pass through, is known as _____.

(Insulator, Conductor, Electrolyte)

10. Such substances, which allow electricity to pass through them and are chemically decomposed, are called _____.

(Electrolytes, Insulators, Metallic conductors)

11. _____ is an example of strong acid.

(Acetic Acid, Carbonic Acid, Hydrochloric Acid)

12. _____ is an example of weak acid.

(Hydrochloric Acid, Acetic Acid, Sulphuric Acid)

13. When NH_4Cl is hydrolyzed, the solution will be _____.

(Acidic, Basic, Neutral)

14. When Na_2CO_3 is hydrolyzed, the solution will be _____.

(Acidic, Basic, Neutral)

15. When blue hydrated copper sulphate is heated _____.

(It changes into white, it turns black, it remains blue)

16. Sulphur has the highest oxidation number in _____.

(SO_2 , H_2SO_4 , H_2SO_3)

17. The reaction between an acid and a base to form a salt and water is called _____.

(Hydration, Hydrolysis, Neutralization)

18. _____ is opposite of Neutralization.

(Hydration, Hydrolysis, Ionization)

19. The substance having pH value 7 is _____.

(Basic, Acidic, Neutral)

20. An aqueous solution whose pH is zero is _____.

(Alkaline, Neutral, Strongly Acidic)

21. Solubility product of slightly soluble salt is denoted by _____.

(K_c , K_p , K_{sp})

22. The increase of oxidation number is known as _____.

(Oxidation, Reduction, Hydrolysis)

23. The decrease of Oxidation number is known as _____.

(Oxidation, Reduction, Electrolysis)

24. One molar solution of glucose contains _____ gms of glucose per dm^3 of solution.

(180, 100, 342)

25. The number of moles of solute present per dm^3 of solution is called _____.

(Molality, Molarity, Normality)

26. 'M' is the symbol used for representing _____.

(Molality, Molarity, Normality)

27. 1 mole of H_2SO_4 is equal to _____.

(98gms, 49gms, 180gms)

28. Buffer solution tends to _____ pH.

(Change, Increase, maintain)

29. The logarithm of reciprocal of hydroxide ion is represented as _____.

(pH, pOH, pOH)

30. In _____ water molecules surround solute particles.

(Hydration, Hydrolysis, Neutralization)

II. Fill in the Blank

1. A mixture of two or more substances, which are homogeneously mixed, is called a _____.

2. _____ is defined as the amount of solute dissolved in a given amount of solvent.

3. A solution is composed of two components _____ and _____.

4. A solution containing one mole of solute per dm^3 of solution is called one _____ solution.

5. Molarity is denoted by _____.

6. 1M solution of NaOH contains _____ gms of it dissolved per dm^3 of solution.

7. A solution containing one mole of solute dissolved by per kg of solvent is called _____ solution.

8. Molality is denoted by _____.

9. 1M solution of H_2SO_4 contains _____ gms of it per kg of solvent.

10. The process in which ions are surrounded by water molecules is called _____.

11. The water molecules attached with the hydrated substance are called _____.

12. Hydrated copper sulphate evolves _____ water molecules on heating.

13. The interaction between salt and water to produce acids and bases is called _____.

14. The products of ionic concentration in a saturated solution at a certain temperature are called the _____.

15. Solubility product constant expressed as _____.

16. The suppression of ionization by adding a common ion is called _____.
17. The process of dissociation of an electrolyte into ions is known as _____.
18. The chemical decomposition of a compound in a solution or in fused state brought about by a flow of electric current is known as _____.
19. Electrolysis is performed in an electrolytic cell, which is known as _____.
20. The positive electrode of a voltmeter is called _____ and negative as _____.
21. A solution, which tends to resist changes in pH is called a _____ solution.
22. A mixture of acetic acid and sodium acetate acts as a _____.
23. According to Sorenson _____ is defined as negative logarithm of the hydrogen ion concentration.
24. pH is mathematically expressed as _____.
25. The pH of a neutral solution is _____.
26. _____ substances have pH values lower than 7.
27. _____ solutions have pH values more than 7.
28. Oxidation is _____ of electron.
29. Reduction is the _____ of electron.
30. Such chemical reactions in which the oxidation number of atoms or ions is changed are called _____ reactions.
31. Oxidation number of a free element is _____.
32. Oxidation number of Oxygen in a compound is _____.
33. The sum of oxidation number of any formula of a compound is _____.
34. The oxidation number of any ion is equal to the _____ on the ion.
35. _____ is the reaction in which an acid reacts with a base to form salt and water.
36. _____ are organic compounds which change colour in accordance with the pH of the medium.
37. An indicator that changes from colourless to pink in the presence of an alkaline solution is called _____.
38. An indicator that changes from red to yellow in the presence of an alkaline solution is called _____.
39. Dissociation constant is denoted by _____.
40. According to Bronsted-Lowry Concept, _____ is the donor of proton and _____ is the acceptor of proton.

41. According to Arrhenius, acid is substance that produces _____ ions when dissolved in water.
42. According to Arrhenius, base is a substance that produces _____ ions when dissolved in water.
43. When ionic product is less than K_{sp} , the solution will _____.
44. When ionic product is greater than K_{sp} , the solution will _____.
45. The electrode at which oxidation takes place is called _____.
46. The electrode at which reduction takes place is called _____.
47. H_3O^+ ion is called _____ ion.
48. The logarithm of reciprocal of hydroxyl ion $(OH)^-$ is called _____.
49. Aqueous solution of NH_4Cl is _____ while that of $NaHCO_3$ is _____.
50. The ionic product of $[H^+]$ and $[OH^-]$ of pure water is _____.
51. An increase in the oxidation number of an element or ion during a chemical change is called _____.
52. A decrease in the oxidation number of an element or ion during a chemical change is called _____.
53. The degree of dissociation _____ with the increase in temperature.
54. The degree of dissociation _____ with the dilution of electrolytic solution.
55. A _____ consists of an electrode immersed in solution of its ion.
56. The potential difference between the electrode and the solution of its salt at equilibrium position is called _____ potential.
57. If the pH of a solution is 14, the solution is _____.
58. If the pH of a solution is 4, the solution is _____.
59. The oxidation number of Mn in $KMnO_4$ is _____.
60. The oxidation number of Fe in $FeCl_3$ is _____.

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I.I.T.Foundation - XI Chemistry MCQ #11

Time: 45 min Student's Name: _____

Full Marks: 50

Chemical Kinetics

I. MCQ - Choose Appropriate Alternative

1. The rate of chemical reaction _____ with increase in concentration of the reactants.

(Increases, Decreases, Does not alter)

2. Ionic reactions of inorganic compounds are _____.

(very slow, moderately slow, very fast)

3. The rate of _____ reactions can be determined.

(Very Slow, Moderately Slow, Very fast)

4. The sum of exponents of the concentrations of reactants is called _____.

(Order of reaction, Molecularity, Equilibrium Constant)

5. The rate of reaction generally _____ in the presence of a suitable catalyst.

(Increases, Decreases, remains constant)

6. The rate of a reaction _____ upon the temperature.

(depends, slightly depends, does not depends)

7. The minimum energy required to bring about a chemical reaction is called _____.

(Bond energy, Ionization energy, Energy of Activation)

8. Oxidation of SO_2 in the presence of V_2O_5 in Sulphuric Acid industry is an example of _____.

(Homogenous catalyst, Heterogeneous catalyst, Negative catalyst)

9. Hydrolyses of ester in the presence of acid is an example of _____.

(Homogenous catalyst, Heterogeneous catalyst, Negative catalyst)

10. Concentration of the reactants _____ with the passage of time during a chemical reaction.

(Increases, Decreases, Does not alter)

11. Concentration of the products _____ with the passage of time during a chemical reaction.

(Increases, Decreases, Does not alter)

12. The rate constant _____ with temperature for a single reaction.

(Varies, Slightly Varies, Does not vary)

13. The rate of reaction at a particular time is called _____.

(Average Rate of reaction, Absolute rate of reaction, Instantaneous rate of reaction)

14. The specific rate constant K has _____ value for all concentrations of the reactant.

(Fixed, Variable, negligible value)

15. By increasing the surface area the rate of reaction can be _____.

(Increased, Decreased, Doubled)

16. MnO_2 when heated with KClO_3 _____.

(Gives up its own oxygen, Produces ozone O_3 , Acts as catalyst)

17. Reactions with high energy of activation proceed with _____.

(High speed, Moderately slow speed, slow speed)

18. The minimum amount of energy required to bring about a chemical reaction is called _____.

(Energy of ionization, Energy of Activation, Energy of Collision)

19. An inhibitor is a catalyst which _____ rate of reaction.

(Increases, Decreases, Does not alter)

20. _____ is the change of the concentration of reactant divided by the time.

(Rate of reaction, Velocity Constant, Molecularity)

II. Fill in the Blank

1. The branch of chemistry, which deals with the study of rates and mechanisms of chemical reactions, is known as _____.

2. Such reactions, which proceeds with very high velocities and are completed very quickly are called _____ reactions.

3. Such reactions, which take place very slowly, are called _____ reactions.

4. Reactions between silver nitrate and sodium chloride to form white precipitates of silver chloride are an example of _____ reaction.

5. Reactions of Organic compounds are slow and are called _____ reactions.

6. There are some reactions, which proceed slowly with a _____ speed.

7. The rate of _____ reaction can only be determined.
8. The amount of chemical change taking place in concentration of the per unit time is called _____ of reaction.
9. Rate of reaction is expressed in _____.
10. The rate of reaction between two specific interval of time is called _____.
11. The addition energy required to bring about a chemical reaction is called _____.
12. According to _____ theory for a chemical reaction to take place, the reacting molecules must come closed together.
13. The addition of _____ helps the reaction by lowering the energy of activation.
14. The rate of reaction _____ with the increase in concentration of the reacting molecules.
15. When the concentration of both the reacting molecules is double, the probability of collisions between them will be _____ times.
16. By _____ the surface area of the reactants, the rate of reaction is increased.
17. Rate of reaction generally _____ with the rise of temperature.
18. A _____ is a substance, which either accelerates or retards the rate of reaction without taking part in the reaction.
19. In the preparation of Oxygen from Potassium Chlorate, _____ is used as catalyst.
20. In the oxidation of SO_2 to SO_3 by the contact process for the manufacture of H_2SO_4 _____ is used as catalyst.
21. An unstable intermediate compound formed during a chemical reaction is called _____.
22. When a catalyst and the reactants are in the same phases, it is known as _____ catalyst.
23. When a catalyst and the reactants are in different phases, it is called _____.
24. When a catalyst increases the rate of reaction, it is called _____ catalyst.
25. When a catalyst retards the rate of reaction, it is called _____ catalyst.
26. A negative catalyst _____ the energy of activation, hence the rate of reaction is decreased.
27. The ratio between the rate of reaction and concentration of reactants is known as _____.
28. Velocity constant is independent of concentration but depends on _____.
29. Ionic reactions are _____ than molecular reactions.
30. The value of specific rates constant for a reaction _____ with time.