The Indian Academy
Nehrugram DEHRADUN
Question Bank – 2013-14
Subject - CHEMISTRY
Class - IX

VERY SHORT ANSWER QUESTIONS.

(Each question carries 1 mark)

1. Name the scientist who has given law of constant proportions.

2. Name the term which is used to denote the size of an atom

3. Name the atom which is the smallest atom of all

4. According to Dalton's symbol what is the symbol for sulphur?

5. What is the atomic mass of copper?

6. What is the formula for ethanol?

7. What is the molecular mass of chlorine(Cl_2)?

8. What is a positively charged ion known as?

9. What is the chemical formula of Carbontetra chloride?

10. How many number of atoms are there in 1 mole of that atom?

11. Name the scientist who discovered electron.

12. The first shell of the Nucleus is represented by which English Alphabet?

13. If n=1, then maximum number of electron in 1st shell will be ?

14. Write down the electron configuration of potassium.

15. Name the Nobel gas whose electronic configuration is 2, 8, 18, 18, 8.

16. Magnesium has two valence electrons in which shell?

17. What is the name given to the pair of atoms such as $_7^{14}N$ and $_7^{15}N$?

18. Name the radioactive Isotopes which are used in the treatment of Cancer.

19. The Valency of Nitrogen in N_2 molecule is what?

20. If atomic number of an element X is 18. Write down its electronic configuration.

SHORT ANSWER QUEST

(Each question carries 2 marks)

01. The nucleus of an atom has 5 protons and 6 neutrons

    (a) What would be the atomic number?

    (b) What would be the mass number?

02. What are isobars? Explain with example.

03. An element has Z=7, what is the valency of the element? Also name the element.

04. Define electrovalency and also write the valency of sodium.

05(i) Which sub atomic particle is not present in an ordinary hydrogen atom?

   (ii) Name the scientist who described the arrangement of electron in an atom.

06. What is the usual symbol for

    (a) Electron   (b) Proton

07. Which shell of an atom can accommodate a maximum of

    (a) 8 electrons   (b) 32 electrons

08. Which subatomic particle was discovered by

    (a) Chadwick   (b) Thomson

09. Define gram atomic mass of a substance. How much is the gram atomic mass of

    Oxygen?

10. Calculate the mass of 1 mole of

    (a) NaCl   (b) $CaCO_3$

11. What is the mass of

    (a) 1 mole of H_2O

    (b) 1 mole of ethanol (C_2H_5OH)

12. Define

(a) Mole

(b) Ion

13. Calculate the molar masses of

(a) Ethyne (C_2H_2)

(b) Sulphur molecule S_8

14. Write down the formula for

(a) Sodium oxide

(b) Calcium Carbonate

15. Give the formulae of the compounds formed from the combination of

(a) Calcium & fluorine

(b) Hydrogen & Sulphur

16. Write down the chemical symbol for

(a) Nitrite Ion

(b) Hydroxide Ion

17. Symbol $\qquad$ ϵ $\qquad$ Cl

Valencies $\qquad$ 4 $\qquad$ 1

Write down the formula of this compound.

18. What is the atomicity of

(a) Oxygen

(b) Ozone

19. What do the following denote

(a) N_2

(b) $2N_2$

20. What is an atom? How do atoms usually exists?

LONG ANSWER QUESTIONS.

(Each question carries 3 marks)

01. (a) Calculate the mass of 0.5 mole of oxygen atom.

(b) Calculate the number of molecules of glucose present in its 90 grams (molecular

mass of glucose is 18 u).

(c) Calculate number of moles of water in 2 grams of water.

02. (a) J. Chadwick discovered a subatomic particles which has no charge and has mass nearly equal to that of a proton. Name the particle and give its location in the atom.

(b) If k and L shells of an atom are completely filled with electrons, then what would be

(i) The total number of electrons in the atom

(ii) Its valency

03. (a) State the law of constant proportion.

(b) Taking the example of water explain the law of constant proportion

(c) Which postulate of Dalton's Atomic Theory explain this law.

04. (a) Draw a sketch of Bohr's model of an atom with three shells.

(b) On the basis of Thomson's model of an atom, explain how the atom is neutral as a whole.

05. Calculate number of atoms in 120 g of Calcium and 120 g of Iron. Which one has more number of atoms and how much is the difference?

06. (a) State the law of conservation of mass.

(b) What mass of silver nitrate will react with 5.85 g of sodium chloride to produce 14.35 g of sodium chloride and 8.5 g of sodium nitrate if that law of conservation of mass is true.

07. Calculate the following quantities in 5.6 g of nitrogen [Atomic mass of N=14 u]

(a) Number of moles of N_2

(b) Number of molecules of N_2

8. On the basis of the number of protons, neutrons and electrons in the sample given

below. Identify

(a) The Cation

(b) The pair of isobars

(c) the pair of isotopes

Sample	Protons	Neutrons	Electrons
A	17	18	16
B	18	19	18
C	17	20	17
D	17	17	17

09. State three postulates of Dalton's atomic Theory.

10. (a) Mention two postulates of J.J. Thomson's Model.

   (b)Compare the properties of electrons and protons.

11. The mass of one atom of element X is 2.0×10^{-23} g

   (a) Calculate the atomic mass of X

   (b) What would element X be?

12. An element X has a mass number 27 and it contains 13 protons.

   (i) Write the symbolic representation of the element.

   (ii) Find the number of neutrons and electrons in the element

   (iii) Write the electronic configuration of the element.

13. (a) Define atomic mass unit.

    (b) Write the chemical formula of

        (i) Ammonium Carbonate

        (ii) Sodium Oxide

14. (a) Give Bohr-Bury rules for distribution of electrons in different shells (any 2)

    (b) For chlorine Z=17, A=35, Give the number of protons, electrons and neutrons

in   (i) Chlorine   (ii) Chlorine Ion

15. (a) Write the formula of the compound

(i) Calcium sulphate

(ii) Aluminium chloride

(b) The average atomic mass of a sample of an element X is 16.2 u. What is the % of isotopes $_8^{16}X$ and $_8^{18}X$ in the sample?

16. (a) Give one important application of isotopes of Cobalt.

(b) Elements from A to E have in them the distribution of e, p and n as follows.

Elements	Electron	Neutrons	Protons
A	4	4	3
B	8	9	9
C	18	22	18
D	17	20	17
E	17	18	17

Making use of these data find

(i) Cation   (ii) anion   (iii) a pair of isotopes

17. (i) Define Avogadro's number. Why it is also known as Avogadro's constant?

(ii) Calculate the molar mass of Na_2O [Given Na=23 u; O=16 u]

(iii) Find the mass of 10 moles of Carbon dioxide. [Given C=12u; O=16u]

18. The composition of nuclear of two atomic species P & Q are given below

Elements	Protons	Neutrons
P	17	18
Q	17	20

(i) What is the mass number of P & Q?

(ii) What is the relation between the two species?

19. (a) Define Molar mass. What are its units?

    (b) Write the names of components represented by

        (i) K_2CO_3 (ii) Na_2SO_4 (iii) $Ca(HCO_3)_2$

20. If the number of molecules in a given sample of Sulphur dioxide (SO_2) is 3.011×10^{23}.

    Calculate the following-

    (i) The number of moles in the given sample

    (ii) Mass of Sulphur dioxide in the given sample.

    (iii) Number of oxygen atoms in the given sample

        [Atomic mass S=32 u; O=16 u]

21. (a) State the law of constant proportion.

    (b) While searching for various atomic mass units, scientists initially took Y_{16} of the

        mass an atom of naturally occurring oxygen as one unit state two reasons for

        these.

22. Define (a) Atomicity   (ii) Valency (iii) Molecule

23. Calculate the molar mass of the following compounds

    (a) Lead Sulphate

    (b) Calcium Phosphate

    [Given atomic masses of various elements Ca (-40), S (-32), O (-16), Pb (-207), P (-31)]

24. (i) Define the term 'atomic mass unit'. How is it linked with relation atomic mass?

    (ii) How do we know the presence of atoms if they do not exist independently for?

        most of the element?

25. Calculate

    (i) Number of molecules in 90 gm of H_2O

(ii) Number of moles in 19 gm of H_2O

(iii) Number of molecules in 60 gm of C_2H_5OH

26. (a) What is the chemical name of the compounds represented by the following formulae

    (i) Al_2O_3 (ii) KNO_3

(b) What is the formula mass of $(NH_4)_2SO_4$

27. An atom has the electronic configuration as 2, 8, 18, 7

    (i) Name the element having the above configuration

    (ii) What is the atomic number of this atom?

    (iii) To which of the following would it be chemically similar?

      7^N, 17^{cl}, 15^P, 18^{Ar}

28. Calculate the number of moles of

    (i) 52 g of He

    (ii) 12.044×10^{23} atoms of He

    (iii) 16 g of Chlorine atom

29. (i) What does the symbol 'u' represent?

    (ii) Give an example of a triatomic molecule of an element.

    (iii) What is the mass of 1mol of water?

30. What do the following symbols represent?

    (i) 1H   (ii) H_2 (iii) 1 Cl

VERY LONG ANSWER QUESTIONS.

(Each question carries 5 marks)

01. (a) An element X has atomic number 19 and its mass number is 39. Calculate the number of electron and neutrons in it.

   (b) Explain Bohr and Bury rules for distribution of electrons into different shells.

Write the distribution of electron in Sodium atom (Z=11)

(c) Define Isobars. Give one example.

02. (a) Write the symbol and name of the element having 14 protons.

(b) Complete the table

Element	Atomic No	Mass No	Proton	Neutron
Cl	17	-	-	18
Si	-	28	-	-
F	-	-	9	10

(c) Give one drawback of Rutherford Model.

03. (a) Define atomic number and atomic mass number of an element.

(b) One atom of an element contains 8 protons and 8 neutrons. Find

(i) number of electron

(ii) atomic number

(iii)Atomic mass

04. (a) Illustrate Rutherford's experiment to explain the model of an atom.

(b) Atomic number of an element is 17. Identify the element, write the electronic configuration & mention its valency.

05. Illustrate postulates of Neil Bohr to explain model of an atom. Identify the element, Write electronic configuration & number of neutrons present in the atom represented by $_{13}^{27}X$.

06. Give reasons

(a) Isotopes of an element are chemically similar

(b) An atom is electronically neutral.

(c) Nobel gases show least reactivity

(d) Nucleus of an atom is heavy & positively charged.

(e) Ions are more stable than atoms.

07. (a) Explain why did Rutherford select a gold foil in his alpha scattering

   experiments?

   (b) What observation in α –scattering experiment led Rutherford to make the

   following observations

   (i) Most of the space is an atom is empty.

   (ii) Nucleus is positively charged

   (c) Mention drawbacks of Rutherford's Model

08.
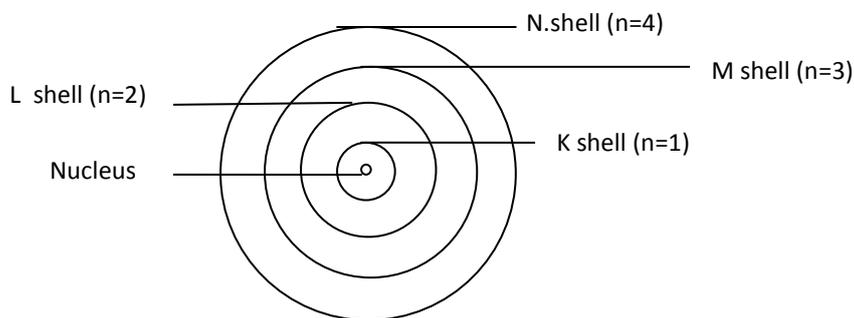
   (i)   Name the scientist who proposed this model of atom.

   (ii)   Write the three postulates of this model

   (iii)   How many maximum electron cabs be accommodated in M orbit?

9.(a) Which of the following pairs are isotopes & which are isobars?

   (i) $_{26}^{58}A$, $_{28}^{58}B$

   (ii) $_{35}^{79}X$, $_{35}^{80}Y$

   Give reason for your choice.

   (b) Elements A & B have atomic numbers 18 and 16 respectively. Which of these

two would be more reactive and why?

(c) If Bromine atom is in the form of say two isotopes $_{35}^{70}Br$ (49.7%) and $_{35}^{81}Br$ (50.3%), then find ^{35}out the atomic mass of bromine atom.

10. (a) Describe briefly Thomson's model of an atom?

(b) Who discovered Neutron?

(c) What are canal Rays?

(d) What is the mass of proton of as compared to electron?

11. (a) Explain the following with one example of each

(i) Atomic number

(ii) Mass number

(b) Give the distribution of electrons in sodium and chlorine atom.

12.(a) Mention one of

(i) Isotope of Cobalt

(ii) Isotope of Iodine

(b) How Rutherford proved that positively charged particles are present in the nucleus of an atom.

13. (i) Calculate the molecular mass of $CaCo_3$ (At mass Ca=40u, C=12u, o=16u)

(ii) Verify by calculating that

(a) 5 moles of CO_2 and 5 moles of H_2O do not have same mass.

(b) 240 g of calcium & 240 g of Magnesium element have a mole ratio of 5:3 (At mass H=1u, Ca=40 u, mg=24u)

14. (a)Write the formula of the compounds formed by the following ions

(i) Cr^{3+} and SO_4^{2-}

(ii) Pb^{2+} and NO_3^{-1}

(b) State the significance of one mole.

(c) Which has more number of atoms 100 g of sodium or 100 g of Iron.

(At mass Na=23 u, Fe=56 u)

15. (a) List the important observation made by Rutherford from his α particle

Scattering experiments

(b) An element Z contains two naturally occurring isotopes $_{17}^{35}Z$ and $_{17}^{37}Z$. If the average atomic mass of this element be 33.5 u. calculate the percentage of two isotopes.

16. (a) Helium atom has an atomic mass of 4u and two protons in its nucleus. How many neutrons does it have?

(b) Write down the electronic configuration of Sulphur (Atomic no. 16)

(c) The atomic mass of an element X is 16.2 u. What are the percentages of isotope X having atomic number 8 and mass number16 & 18.

17. (a) Write the maximum number of electrons which can be accommodated in K,L,M, N shell & give the rule which decides it.

(b) Atom A has a mass number 238 and atomic number 92 and atom B has a mass number 235 and atomic number 92

(i) How many protons, atoms A and B have?

(ii) How many neutrons, atoms A & B have?

(iii)Are atoms A & B isotopes of the same element? How?

18. Read the following passage and with your own knowledge answer the following questions- In order to overcome the objections raised against Rutherford's model of the atom, Neil Bohr put forward, the following postulates about the model of an atom

(i) Only certain special orbit known as discrete orbits of electrons are allowed inside the atom

(ii) while resolving in discrete orbits the electrons do not radiate energy.

Fill in the blanks

(a) Atoms are made up of _____, _____ & _____.

(b) _____ amended Rutherford Shortcomings

(c) Electrons do not radiate energy while revolving in _____ orbits

19. (a) The valency of an element A is 4. Write the formula of its oxide

(b) What is a charge on electron?

(c) If   (i) Sodium (2, 8, 1) gains one electron how will you denote it, in terms of

charge

(ii) If it loses one electron how will you denote it, in terms of change.

(iii) If sodium loses two electrons than how will you denote it.

20. The atom of an element X is written $_{14}^{29}X$

(i) What does 14 indicate in X?

(ii) What does 29 indicate in X?

(iii) Write down its electronic configuration.

(iv) How many protons are there in X?

(v) What is the number of electrons in X?

SECTION B

MCQ

(Each question carries 1 mark)

1. The balancing of chemical equation is based on

    (a) Law of combining volume

    (b) Law of conservation of mass

    (c) Law of constant proportion

    (d) Avogadro's Law

2. Which of the following postulates of Dalton's atomic theory result of the law of conservation of mass

    (a) Atoms combine in the ratio of small whole number to form compounds

    (b) Atoms of given elements are identical in mass

    (c) Atoms of different elements have different masses.

    (d)All of these.

3. Which of the following chemical equation represents law of conservation of mass

    (a) $2NaCl + CaO ---- Na_2O + CaCl_2$

    (b) $Zn + HCl ---- ZnCl_2 + H_2$

    (c) $Mg + HCl ---- MgCl_2 + H_2$

    (d) All of above

4. 5.3 gm of sodium carbonate and 6 gm of ethanoic acid react together & produce 2.2 gm of Carbon dioxide, 0.9 gm of Carbon water & 0.9 gm of ethanol. The Weight of sodium ethanoate is

    (a) 0.82 gm   (b) 82 gm (c) 8.2 gm   (d) None of these

5. Mass can neither be created nor destroyed in law of

   (a) Multiple proportions

   (b) Conservation of man

   (c) Constant proportion

   (d) Combining volume

6. At 0° C or 273^oK, the physical state of water is observed as:

   (a) Solid   (b) Liquid (c) Vapour (d) Both solid and liquid

7. When do ice and water co-exact under atmosphere pressure ?

   (a) At 0° C   (b) below 0° C   c) above 0° C   (d) at 5° C

8. What is the state of water at 100^oC ?

   (a) Solid   (b) Liquid (c) Vapour (d) Vapour and Liquid

9. For determining the melting paint of ice we should prefer

   (a) ice made from distilled water

   (b) ice made from tap water

   (c) dry crushed ice mixed with salt

   (d) A mixture of ice and salt

10. When a thermometer is kept in ice, the reading shows that

   (a) Temperature keeps increasing

   (b) Temperature keeps decreasing

(c) Temperature increases first and then decreases

(d) Temperature first decreases and then remains constant at $0^{o}C$

11. A thermometer has 20 equal divisions between $90^{o}C$ and $100^{o}C$ mark. A student

While determining the boiling point of water finds that the mercury threads

becomes stationary at the 19th mark above $90^{o}C$. he should record the boiling

point of water as

(a) $90.19^{o}C$ (b) $99.5^{o}C$ (c) $109^{o}C$ (d) $119^{o}C$

12. For the accurate determination of the boiling point of water, we use

(a) Tap water (b) distilled water (c) salt water (d) sugar solution

13. IF pure water is heated it will start boiling at

(a) 173 k (b) 100 k   (c) 373 k   (d) 273 k

14. A thermometer shows 20 diversions between $10^{o}C$ and $20^{o}C$. What is the least?

count of thermometer?

(a) 1   (b) 2   (c) 0.1   (d) 0.5

15. When water boils, its temperature

(a) decreases   (b) increases

(c) remain the same   (d) first increases and then decreases

16. Which of the following would your choose to determine the melting point of ice

in you laboratory?

(a) dry crushed ice   (b) Ice cubes

(c) Ice added to water   (d) slab of ice

17. Water in a container is heated uniformly from $0^{o}C$ to $100^{o}C$, the volume

(a) increases continuously

(b) decreases continuously

(c) decreases up to 4°C and increases further

(d) increases up to 4°C decreases further.

18. Which of the following apparatus is required to determine the boiling point of?

water

(a) Tripod stand, conical flask, thermometer, wire gauze, stand with clamp, pair of tongs

(b) Funnel, burner, clamp &stand, test tube, thermometer, wire gauge, stand with clamp

(c) Boiling tube, beaker, thermometer, burner cork with one hole, stand with clamp, wire gauze

(d) Round bottom flask, burner, thermometer, wire gauge, stand with clamp, cork with two holes, glass tube

19. What is not a correct precaution to be followed by a student to determine the

melting point of ice.

(a) Zero mark of the thermometer should remain above the ice surface

(b) keep stirring the mixture and look at the thermometer

(c) Crush the ice into small pieces

(d) do not dip the thermometer in crushed ice

20. Which of the following statement is right with reference to the melting of ice?

(a) At melting point only ice exits

(b) At melting point only water exists

(c) At melting point both ice and water exist

(d) At melting point ice, water and stream exist

21. While heating a liquid it has to be stirred properly. this is to let

    (a) the dust particles not settle at the bottom

    (b) the liquid gets uniform temperature throughout

    (c) the liquid gets heated quickly

    (d) the liquid evaporates faster

22. The boiling point of water at the atmospheric pressure is

    (a) 373 k   (b) 273 k   (c) 372 k   (d) 723 k

23. The hydrogen peroxide (H_2O_2), the proportion of hydrogen and oxygen by mass is

    (a) 1:8   (b) 1:16   (c) 8:1   (d) 16:1

24. One nm is equal to

    (a) 10^{-9} mm   (b) 10^{-7} cm   (c) 10^{-9} cm   (d) 10^{-6} m

25. The law of conservation of mass was given by

    (a) Dalton   (b) Proust   (c) Lavorsier (d) Berz elius

26. The Latin language name of an element is natruim. The English name of the

    element is

    (a) sodium   (b) Potassium   (c) Magnesium (d) Sulphur

27. The symbol of a metal element which is used in making thermometer is

    (a) Ag   (b) Hg   (c) Mg   (d) Sg

28. The atomic number of an element X is 13, what will be the number of electrons in

    its ion X^{3t}

    (a) 11   (b) 15   (c) 16   (d) 10

29. Which of the following represent a correct chemical formula?

   (a) $CaCl$　　　(b) Na_3N　　　(c) $NaSO_4$　　　(d) NaS

30. If the number of electrons in an ion Z^{3-0} is 10, the atomic number of element Z will　be

   (a) 7　　　　　(b)　5　　　　　(c) 10　　　　　(d)　8

31.The atomicties of Ozone Sulphur, Phosphorous and argan are respectively

   (a) 8,3,4 &1　　　(b) 1,3,4 &8

   (c) 4, 1, 8 &3　　　(d) 3, 8, 4 &1

32. The English name of an element is potassium its Latin name will be

   (a) Plumbum　(b) Cuprum

   (c) Kaluim　　　(d) Natrium

33. One of the following element has an atomicity of 'one'. This element is

   (a) Helium　(b) Hydrogen

   (c) Sulphur　(d) Ozone

34. The formula of a compound is X_3Y. The valencies of element X and Y will be

   respectively.

   (a) 1 and 3　　　(b) 3 and 1

   (c) 2 and 3　　　(d) 3 and 2

35. The formula of the sulphate of an element X is $X_2(SO_4)_3$. The formula of nitride of

element X will be

(a) X_2N (b) XN_2

(c) XN   (d) X_2N_3

36. The cation of an element has

(a) the same number of electron as its neutral atom

(b) more electrons than a neutral atom

(c) less proton than a neutral

(d) less electron than a neutral atom

37. The atomic number of an element ϵ is 16. The number of electrons in its ion ϵ^{2-}

will be

(a) 16   (b) 18   (c) 15   (d) 14

38. Which of the following represent a correct chemical formula?

(a) CaCl   (b) Na_3N (c) $NaSO_4$ (d) NaS

39. If the number of electron in an ion Z^{3-} is 10, the atomic number of element Z will

be

(a) 7   (b) 5   (c) 10   (d) 8

40. A particle X has 17 protons, 18 neutrons and 18 electrons. This particle is most

likely to be

(a) a cation   (b) an anion

(c) a molecule   (d) a compound