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VICTORIOUS TUITION CENTER

IMPORTANT CHEMISTRY - 4 and 7 MARK THEORY QUESTIONS

10th Standard

SCIENCE

1) (a) An element shows variable valencies 4 and 6. Write the formulae of its two oxides.
   (b) An element forms an oxide A_2O_5.
   (i) What is the valency of the element A?
   (ii) What will be the formula of the chloride of the element?

2) Answer the following questions with respect to periods of the modern periodic table.
   (i) Longest period
   (ii) Shortest period
   (iii) Number of elements in 1st period
   (iv) Elements of period 1
   (v) Number of elements in period 4

3) Answer the following in one word.
   (i) What is Slag?
   (ii) Give an example of an basic flux.
   (iii) How is Haematite ore concentrated?
   (iv) Give an example of an ore concentrated by froth flotation.
   (v) What is Gangue?
   (vi) Name the ore of aluminium.

4) Complete the following reactions.
   (i) $2Al + 3H_2O \rightarrow \underline{\quad ? \quad} + 3H_2\uparrow$
   (ii) $2Al + 2NaOH + 2H_2O \rightarrow \underline{\quad ? \quad} + 3H_2\uparrow$
   (iii) $2Al + 6H_2SO_4 \rightarrow Al_2(SO_4)_3 + 6H_2O + \underline{\quad ? \quad}\uparrow$

5) Atoms of seven elements A, B, C, D, E, F and G have a different number of electronic shells but have the same number of electrons in their outermost shells. The elements A and C combine with chlorine to form an acid and common salt respectively. The oxide of element A is liquid at room temperature and is a neutral substance while the oxides of the remaining six elements are basic in nature. Based on the above information, answer the following questions given ahead:
   1. What could the element A be?
   2. Will element A to G belong to the same period or same group of the periodic table?
   3. Write the formula of the compound formed by the reaction of the element A with oxygen.
   4. Show the formation of the compound by a combination of element C with chlorine with the help of electronic structure.
   5. What would be the ratio of number of combining atoms in a compound formed by the combination element A with carbon?
   6. Which one of the given elements is likely to have the smallest atomic radius?

6) The following table shows the position of six elements A, B, C, E and F in the period table.

Groups / Periods	1	2	3 to 12	13	14	15	16	17	18
2		A				B			C
3		D			E				F

Using the above table answer the following questions:
(a) Which element will form only covalent compounds?
(b) Which element is a metal with valency 2?

(c) Which element is a non-metal with valency of 3?

(d) Out of D and E, which one has more atomic radius and why?

(e) Write a common name for the family of elements C and F.

7) Atoms of eight elements A, B, C, D, E, F, G and H have the same number of electronic shells but different number of electrons in their outermost shell. It was found that elements A and G combine to form an ionic compound. This compound is added in a small amount to almost all vegetable dishes during cooking Oxides of elements A and B are basic in nature while those of E and F are acidic. The oxide of D is almost neutral. Based on the above information answer the following questions:

1. Towhich group or period of the periodic table do the listed elements belong?

2. What would be the nature of compound formed by a combination of elements B and F?

3. Which two elements could definitely be metals?

4. Which one of the eight elements is most likely to be found in gaseous state at room temperature?

5. If the number of electrons in the outermost shell of elements C and G be 3 and 7 respectively, write the formula of the compound formed by the combination of C and G

8) Twoelements X and Ybelong to group 1and 2 respectively in the same period. Compare them with respect to:

(a) The number of valence electrons

(b) Valency

(c) Metallic character

(d) Size of the atoms

(e) Formulae oftheir oxides and chlorides.

9) We often find small packets of silica gel in food packs, leather and electronic goods.

(i) What is silica gel?

(ii) Why are these little packets of silica gel kept in leather products?

(iii) What property of silica gel is the reason for its extensive use?

(iv) What are hygroscopic substances?

10) Based on separation techniques) complete the following. The first one is done for you.

	Mixture	**Type**	**Separation Technique**	**Principle**
1.	Alcohol + water	Homogeneous	Fractional distilation	Difference in boiling point
2.	Sulphur+ carbon disulphide	-	-	-
3.	Sand + water	-	-	-
4.	Pigments of flower	-	-	-

11) Some solids dissolve easily in liquids while the others do not.

1. What is the name given to the liquids which dissolve solids?

2. What is the name given to the clear liquid formed when a solid dissolves in a liquid?

3. What is the name given to the liquid which contains in it some suspended particles?

12) A house wife churned full cream with a milk churner

1 What will she observe after churning the milk?

2. What could be the possible reason for the observation?

13) The table given below shows number of grams of five different solids dissolving in 100 g of the solvents: water, alcohol and chloroform (all at 20°C).

Solvent	**Salt**	**Sugar**	**Iodine**	**Chalk**	**Urea**

Solvent	Salt	Sugar	Iodine	Chalk	Urea
Water	36.0	204.0	0.6	0.0	100.0
Alcohol	0.0	0.0	20.0	0.0	16.0
Chloroform	0.0	0.0	3.0	0.0	0.0

1. Which solid dissolves best in water at 20°C?
2. Which solid is maximum soluble in alcohol?
3. Which solid is insoluble in all the three solvents?

14) Write the chemical equations for the following and identify the type of chemical reactions

i) Burning of magnesium in air

ii) Electric current is passed aqueous solution of sodium chloride

iii) Ammonium hydroxide reacts with nitric acid

15) A water insoluble substance 'X' on reacting with dilute H SO released a colourless and odourless gas accompanied by brisk effervescence. When the gas was passed through water) the solution obtained turned blue litmus red. On bubbling the gas through lime water) it initially became milky and the milkiness disappeared when the gas was passed in excess. Identify the substance 'X' and write the chemical equations of the reactions involved.

16) You are given the following materials

1. Marble chips
2. Dilute hydrochloric acid
3. Zinc granules

Identify the type of reaction when marble chips and zinc granules are added separately to acid taken in two tubes. Write chemical equations in each case.

17) Study the given diagram and answer the following questions:

(a) Write the chemical reaction involved in the process.

(b) Mention the colour of:

1. Copper powder and
2. the substance formed after heating it.

c) How can wereverse the above reaction? Write the equation for the reverse reaction and state the substance that undergoes oxidation and the substance the undergoes reduction.

18) (a) Based on the reactions given below, arrange the metals involved in these reactions in decreasing order of reactivity. Give suitable explanation.

1. $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$
2. $Cu + 2AgNO_3 \longrightarrow Cu(NO_3)_2 + 2Ag$
3. $Zn + FeSO_4 \longrightarrow ZnSO_4 + Fe$
4. $Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$

b) What is the nature of the reactions?

19) A strip of a metal X is immersed in the aqueous solution of salt YSO_4 blue in colour. After sometime, a layer the metal Y from the salt solution is deposited on the strip of the metal X. Whereas the metal X is used for galvanisation, the metal Y is employed in maktng electric cables.

1. Predict the metal X.

2. What could be the metal Y?

3. Can you name the salt YSO_4?

4. What is the nature of the chemical reaction taking place?

20) The gases hydrogen chlorine do not react with each other even if kept together for a long time. However, in the presence of sun light, they readily combine. What does actually happen?

21) A, Band C are three elements which undergo chemical reactions according to following equations.

$A_2O_3 + 2B \longrightarrow B_2O_3 + 2A$

$3CSO_4 + 2B \longrightarrow B_2(SO_4)_3 + 3C$

$3CO + 2A \longrightarrow A_2O_3 + 3C$

Answer the following questions:

(a) Which element is the most reactive?

(b) Which element is the least reactive?

22) Differentiate soaps and detergents.

23) Statement : Acetic acid reacts with baking soda with a brisk effervescence.

Answer the question with respect to the above statement

(i) Write the chemical formula of acetic acid.

(ii) What is the IUPAC name of CH_3COOH?

(iii) What is baking soda?

(iv) Name the gas that evolves with brisk effervescence during the above reaction.

(v) Write the equation for the above chemical change.

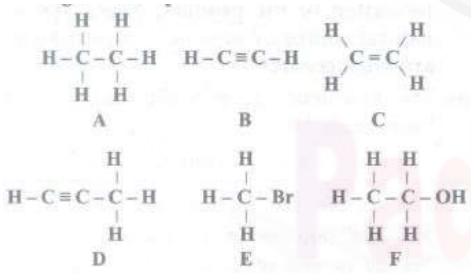
24) Name the functional group of organic compounds that can be hydrogenated. With the help of suitable example, explain the process of hydrogenation mentioning the conditions of the reaction and any one change in physical property with the formation of the product. Name anyone natural source of organic compounds that are hydrogenated.

25) An organic compound A of molecular formula C_2H_4 on reduction gives another compound B of molecular formula C_2H_6. B on reaction with chlorine in the presence of sunlight gives C of molecular formula C_2H_5Cl.

(a) Name the compounds A, Band C.

(b) Write chemical equation for the conversion of A to B and name the type of reaction

26) A to F are the structural formulae of some organic compounds:



(i) Give the letters which represent the same family.

(ii) Give the letters which do not represent hydrocarbons.

(iii) Flow can 'C' be converted into A?

27) (a) A test tube contains a brown liquid in it. The colour of the liquid remains the same when methane is passed through it but it disappears when ethene is passed. Suggest the name of the liquid brown in colour. Give the chemical equation involved.

(b) The formula ofan ester is $C_3H_7COOC_2H_5$. Write the formulae of the acid and alcohol from which the ester is prepared.

28) An organic compound A' of molecular formula C_2H_6O on oxidation with dilute alkaline $KMnO_4$ solution gives an acid 'B' with the same number of carbon atoms. Compound A' is often used for sterilization of skin by doctors. Name the compound. Write the chemical equation involved in the formation of 'B' from A.

29) Give the salient features of "Modern atomic theory"

30) Derive the relationship between Relative molecular mass and Vapour density

31) a) State the reason for addition of caustic alkali to bauxite ore during purification of bauxite.

b) Along with cryolite and alumina, another substance is added to the electrolyte mixture. Name the substance and give one reason for the addition

32) The electronic configuration of metal A is 2,8,18,1.

The metal A when exposed to air and moisture forms B a green layered compound. A with con. H2SO4 forms C and D along with water. D is a gaseous compound. Find A,B,C and D.

33) Explain smelting process

34) Explain the variation of electronegativity down a group and across a period.

35) Explain hydraulic washing with a neat diagram.

36) How are magnetic ores separated from non magnetic impurities? Explain.

37) How is zinc blende concentrated? Explain it with a neat diagram

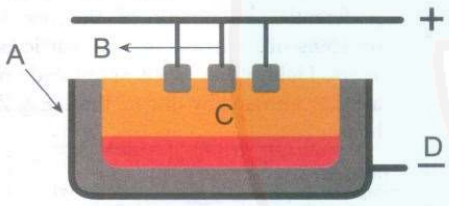
38) Explain Bessemerisation

39) Explain the process of Smelting of Haematite ore in a Blast Furnace.

40) Explain the types of corrosion.

41) What are the methods preventing corrosion?

42) Redraw and label the diagram. Then answer the following questions.



(a) What process does the diagram represent?

(b) Why does the graphite rod need to be replaced often?

(c) Give reason for the melting point of the electrolyte.

(d) Write the overall equation of this process.

43) Write notes on

i) saturated solution

ii) unsaturated solution

44) Write notes on various factors affecting solubility

45) a) What happens when $MgSO_4.7H_2O$ is heated? Write the appropriate equation

b) Define solubility

46) In what way hygroscopic substances differ from deliquescent substances

47) What are called thermolysis reactions?

48) Explain the types of double displacement reactions with examples.

49) Explain the factors influencing the rate of a reaction

50) How does pH play an important role in everyday life?

51) What is a chemical equilibrium? What are its characteristics?

52) What is called homologous series? Give any three of its characteristics?

53) Arrive at, systematically, the IUPAC name of the compound: $CH_3–CH_2–CH_2–OH$.

54) How is ethanol manufactured from sugarcane?

55) Give the balanced chemical equation of the following reactions:
(i) Neutralization of NaOH with ethanoic acid.
(ii) Evolution of carbon dioxide by the action of ethanoic acid with NaHCO3.
(iii) Oxidation of ethanol by acidified potassium dichromate.
(iv) Combustion of ethanol.

56) Explain the mechanism of cleansing action of soap.

57) Write the characteristics of organic compounds.

58) How will you classify organic compounds based on the pattern of carbon chain?

59) Write the characteristics of hydrocarbons.

60) What are the advantages of detergents over soaps?

61) Explain how ethanol is manufactured from molasses?

62) How to identify saturated and unsaturated compounds?

63) 1.Calcium carbonate is decomposed on heating in the following reaction
$CaCO_3 \rightarrow CaO + CO_2$
i. How many moles of Calcium carbonate are involved in this reaction?
ii. Calculate the gram molecular mass of calcium carbonate involved in this reaction
iii. How many moles of CO2 are there in this equation?

64) Metal A belongs to period 3 and group 13. A in red hot condition reacts with steam to form B. A with strong alkali forms C. Find A,B and C with reactions

65) Vinu dissolves 50 g of sugar in 250 ml of hot water, Sarath dissolves 50 g of same sugar in 250 ml of cold water. Who will get faster dissolution of sugar? and Why?

66) 'A' is a blue coloured crystaline salt. On heating it loses blue colour and to give 'B'. When water is added, 'B' gives back to 'A'. Identify A and B, write the equation

67) A solid compound ‘A’ decomposes on heating into ‘B’ and a gas ‘C’. On passing the gas ‘C’ through water, it becomes acidic. Identify A, B and C.

68) The molecular formula of an alcohol is $C_4H_{10}O$. The locant number of its –OH group is 2.
(i) Draw its structural formula.
(ii) Give its IUPAC name.
(iii) Is it saturated or unsaturated?

69) An organic compound ‘A’ is widely used as a preservative and has the molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound ‘B’.
(i) Identify the compound ‘A’.
(ii) Write the chemical equation for its reaction with ethanol to form compound ‘B’.
(iii) Name the process.

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