

CLASS-X

CHEMISTRY

Maximum Marks:80

Time allowed:Two hours

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15minutes.

This time is to be spent in reading the question paper.

' The time given at the head of this Paper is the time allowed for writing the answers.'

This Paper is divided into two Sections.

Attempt all questions from Section A and any four questions from Section B.

The intended marks for questions or parts of questions are given in brackets[**]**.

**SECTION A (Attempt all questions from this Section.)**

Question1 Choose the correct answers to the questions from the given options. [15]

(i) The basicity of acetic acid is:

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

(ii) Which of the following is not true with respect to nitric acid?

a.It is a strong reducing agent

b. It is a strong oxidizing agent

c. It is unstable to heat

d. It liberates sulphur dioxide gas when treated with potassium sulphite.

(iii) The functional group of methanol is:

(a)  $>C=O$

(b)-OH

(c)-CHO

(D)-COOH

(iv) The catalyst used in Ostwald's process is \_\_\_ a. finely divided iron / vanadium pentoxide b. graphite d. platinum

(v) The vapour density of  $\text{CH}_3\text{OH}$  is \_ \_ \_ \_

(At. Wt. C = 12, H=1, O =16)

a.32 b.18 c.6 d.34

(vi) An example of a cyclic organic compound is: c. butene d. benzene , a.propene , b. pentene

(vii) Which of the following is not alloy of copper?

a. Solder b. Bronze c. Duralumin d. Brass

(viii) The hydrocarbon formed when sodium propanoate and soda lime are heated together:

a. Methane b. Ethane c. Ethene d. propane

(ix) Aqua- regia is a mixture of

(a) conc. HCl (3 parts) and conc.  $\text{HNO}_3$  (1 part)

b. conc. HCl (1 part) and conc.  $\text{HNO}_3$  (3 parts)

c. dil. HCl and conc.  $\text{HNO}_3$

d. conc. HCl and dil.  $\text{HNO}_3$

(x) The bond present between oxygen atoms in  $\text{O}_2$  molecule is:

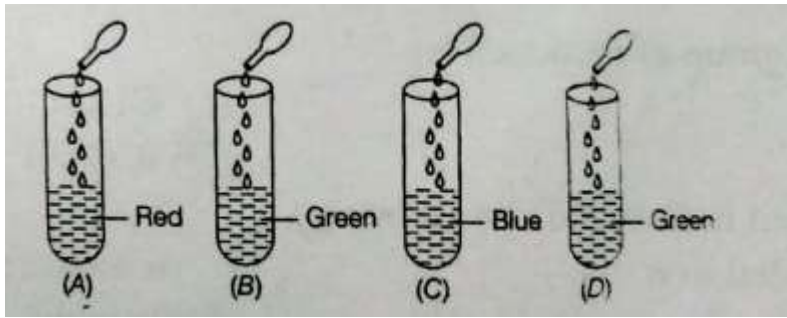
a. single covalent bond

b. double covalent bond

c. triple covalent bond

d. ionic bond

(xi) On adding few drops of universal indicator to four colourless solutions, A, B, C and D having pH 2, 10, 9 and 7 respectively. Which of the following test tube is labelled with incorrect colour?



a.A b.B C. C\_d:'D

(xii) The indicator which changes to pink colour in analkaline solution is -

- a. blue litmus
- b. Red litmus
- c. methyl orange
- D.phenolphthalein

(xiii) Dehydration of ethanol with  $Al_2O_3$  produces -

- a. ethane
- b. ethyne
- c. ethene
- d. ethanoic acid

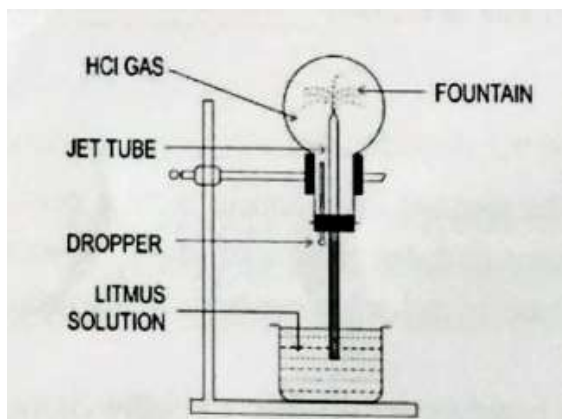
(xiv) An element with atomic number 19 will most likely combine chemically with the element whose atomic number is

- A.17
- B.11
- C.18
- D.20

(xv) The brown ring test is given by

- a.  $CO_3^{2-}$
- b.  $Cl^-$
- c.  $SO_3^{2-}$
- d.  $NO_3^-$

Question 2:The set up shown below is that of the fountain experiment with hydrogen chloride in the flask. [5]



The fountain starts when a few drops of water from the dropper are introduced into the flask. Instead of drops of water, Virat Started the fountain by introducing a few drops of sodium hydroxide into the flask.

a. Explain why the litmus solution gets sucked up when sodium hydroxide is used.

b. What will be the colour of the fountain when sodium hydroxide is used? Justify your answer.

c. If instead of HCl gas, ammonia gas is filled in the flask and water is introduced from the dropper, will there be a different observation? Justify your answer.

(ii) Match the following Column A with Column B. [5]

a. Sodium chloride	1. has two shared pair of electrons
b. Methane	2. has high melting and boiling points
c. Hydrogen chloride gas	3. a greenhouse gas
d. Oxidation reaction	4. has low melting and boiling points~
e. Water	$5 \text{Zn} - 2\text{e}^- \rightarrow \text{Zn}^{2+}$
	$6. \text{S} + 2\text{e}^- \rightarrow \text{S}^{2-}$

(iii) Complete the following by choosing the correct answer from the bracket.[5]

a. Alkanes undergo \_\_\_\_ (addition / substitution) reaction

b. Metals are good .....( oxidizing agents/reducing agents).

c. Conversion of ethene to ethane is an example of \_\_\_\_\_ (hydration / hydrogenation).

d. The application of Gay -Lussac's law is applicable only in case of \_\_\_\_\_ (gases /solids).

e. An aqueous solution of HCl gas is named \_\_\_\_ (muriatic acid/aqua fortis).

(iv) Identify the following: [5]

a. The energy required to remove an election from a neutral gaseous atom.

- b. Tendency of an element to form chains of identical atoms.
- c. The name of the process by which ammonia is manufactured on a large scale.
- d. The type of covalent bond generally formed between dissimilar atoms having different electronegativity.
- e. The flame used for welding and cutting of metals.

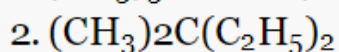
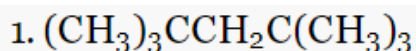
V. a. Draw the structural diagram for the following compounds: [5]

1. Propene

2. 1,2-dichloroethane

3. But-2-yne

b. Give the IUPAC name of the following organic compounds.



## SECTION B (Attempt any four questions)

Question 3:

(i) "The electron affinity of an element X is greater than that of element Y. [3]

a. How is the oxidizing power of X likely to compare with that of Y?

b. How is the electronegativity of X likely to compare with that of Y?

c. State whether X is likely to be placed to the left or to the right of Y in the periodic table?

(ii) Name the alloy which is made up of - [2]

a. copper, zinc and tin b. lead and tin

(iii) Give reasons. [3]

a. Ethene undergoes addition reaction.

b. Hydrocarbons can be used as fuels.

c. Ionic compound do not conduct electricity in solid state.

(iv) Draw the electron dot diagram of ammonium ion. [2]

Question 4:

~ Arrange the following as per the instructions given in the brackets: [3]

a) Al, K, Mg, Ca (decreasing order of its reactivity)

b) N, Be, O, C (increasing order of non-metallic character)

c) P, Si, F, Be (decreasing order of valence electrons)

(ii) Complete and balance the following equations. [3]

- a)  $\text{NH}_4\text{Cl} + \text{Ca}(\text{OH})_2 \rightarrow$   
 b)  $\text{CuSO}_4 + \text{NH}_4\text{OH} \rightarrow$   
 c)  $\text{Cu} + \text{Conc. HNO}_3 \rightarrow$

The Empirical formula of an organic compound is  $\text{CHCl}_2$ .

If its relative molecular mass is 168, what is its molecular formula?

[At. Wt. C = 12, H = 1, Cl = 35.5]

(iv) Choose the answer from the list which fits in the description: [2]

[PbO, N&Cl,  $\text{CCl}_4$ , CuO] a) An amphoteric oxide fl:D b) A compound which undergoes thermal dissociation.

Question 5: (i) Give a balanced chemical equation for the following conversions with conditions. [2]

a) Ethyne from calcium carbide b) Monochloromethane from methane

(ii) Distinguish between the following as directed. [2]

- a) Dil.  $\text{H}_2\text{SO}_4$  and dil. HCl (using lead nitrate)  
 b) Preparation of  $\text{NH}_3$  and  $\text{H}_2\text{SO}_4$  (using catalyst)

(iii) Find the percentage composition of various elements in sodium carbonate,

$\text{Na}_2\text{CO}_3$  (Given that, the relative atomic masses of O=16, Na = 23 and C=12)[3]

(iv) Answer the following questions regarding electrorefining of copper.[3]

a) What is the cathode made up of?

b) Write the reaction that takes place at the anode

c) Blue colour of  $\text{CuSO}_4$  solution slowly disappear when iron rod is dipped in it.

Give reaction for this.

Question 6:

(i) An element X (atomic number= 17) reacts with an element Y (atomic number =20) to form a divalent halide. Where in the periodic table are the elements X and Y placed?

[2]

(ii) Answer the following questions based on the extraction of aluminum from alumina by Hall- Heroult's process. [2]

a. What is the function of cryolite used along with alumina as the electrolyte?

b. Why is powdered coke sprinkled on top of the electrolyte?

(iii) State one relevant observation for each of the following reactions. [3]

a) Calcium nitrate is added to sodium hydroxide solution.

b) Hydrogen chloride is passed through silver nitrate solution.

c) Zinc carbonate ore is heated in absence of air.

(iv) What will be the empirical formula and molecular formula of an organic compound from the data given below: [3]

C = 75.92% 2 H = 6.32% and N = 17.76%.

The vapour density of the compound is 39.5.

[At wt. C = 12, H = 1, N = 14]

Question 7:

(i) State two main uses of ammonia. [2]

(ii) Suresh prepared an acidic solution X that has a pH of 5. How will the pH of the solution X change on addition of the following: [2]

a) Hydrochloric acid b) A solution of base

(iii) State whether the following statements are true or false. Justify your answer. [3]

a) Atomic size decreases across a period but increases down a group.

b) Elements belonging to the same group have similar chemical properties.

(iv) Define: [3]

a) Electron affinity. b) Unsaturated hydrocarbon. c) Non-electrolytes.

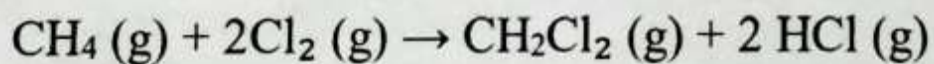
Question 8:

a) Identify the gas evolved when the following reaction takes place. [2]

(a) Sodium sulphite reacts with dilute sulphuric acid (b) Electrolysis of molten lead bromide.

(ii) Solve:

40 cm<sup>3</sup> of methane reacts with chlorine as per the following reaction [3]



Find the volume of HCl and Cl<sub>2</sub> gas formed.

(iii) Explain the following: [3] (a) Direct absorption of HCl gas in water is not preferred.

(b) All glass apparatus is used in the laboratory preparation of HNO<sub>3</sub>. (c) Blue vitriol treated with cone. H<sub>2</sub>SO<sub>4</sub>, it becomes white.