

Shri Shantadurga Higher Secondary School, Bicholim-Goa.
First Terminal Examination October/November-2018

Std: XI Science

Max Marks: 55

Date: 26/10/2018

Chemistry

Duration: 150 Minutes

Instructions:-

1. All questions are compulsory; however question 8, 24, and 25 has internal choice.
2. Use of calculator is not permitted, however logarithmic table will be provided on request.
3. Every Question should be attempted only once.

Section-A consists of 7 questions of 1 mark each.

Section-B consists of 8 questions of 2 marks each.

Section-C consists of 8 questions of 3 marks each.

Section-D consists of 2 questions of 4 marks each.

$$N_A = 6.022 \times 10^{23};$$

At mass (u): H=1, C=12, O=16, S=32; K=39

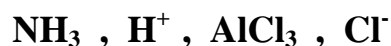
Section-A

- Q.1. Shortest bond length is observed in----- (1)
C-C # C=C # C≡C # all of these
- Q.2. A mixture of two gases, having partial pressure p_1 and p_2 , has total pressure p , then: (1)
$p = p_1 + p_2$ # $p = \sqrt{p_1 + p_2}$ # $p = p_1 \times p_2$ # $p = \frac{p_1 + p_2}{2}$
- Q.3. Synthesis gas is a mixture of ----- (1)
CO+CH₃ # CO+ H₂ # C+CO # C+H₂O₂
- Q.4. Increased concentration of CO₂ in atmosphere is responsible for ----- (1)
greenhouse effect # acid rain # lack of photosynthesis # death of aquatic life
- Q.5. Name the experiment that formed the basis of **Rutherford's model** of atom. (1)
- Q.6. Write the general electronic configuration for **f-block** elements. (1)
- Q.7. Suggest any two methods to avoid/reduce **Sound** pollution. (1)

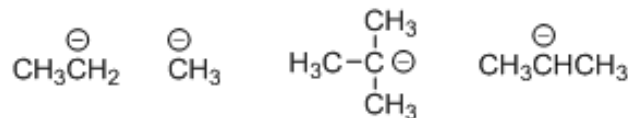
Section-B

- Q.8. Calculate the **molarity** of a solution containing 20.7g of potassium carbonate (K₂CO₃) dissolved in 500ml of solution. (2)
- OR**
- Q.8. The composition of an organic compound is 92.4% **Carbon** and 7.6% **Hydrogen**. (2)
Determine the **empirical formula** of the compound.
- Q.9. Give reason for the following. (2)
a) Boron has less **ionization enthalpy** than Beryllium.
b) Oxygen has lower **ionization enthalpy** than Nitrogen and Fluorine
- Q.10. Arrange the following as stated. (2)
a) in increasing order of Ionic sizes
Na⁺, F⁻, O²⁻
b) in increasing order of electronegativity
H, F, Cl

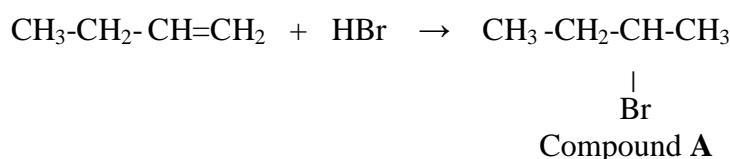
- Q.11 Write any four postulates of **kinetic molecular theory of Gases**. (2)
- Q.12 Write a point of **similarity** and a point of **difference** between **hydrogen** and **halogen**. (2)
- Q.13 a) Classify the following species as **nucleophile** and **electrophile**. (2)



- b) Arrange and write the following **carbanions** in increasing order of their stabilities.



- Q.14 Answer the following with respect to the reaction given below. (2)



- a) Write the **type** of the above organic reaction.
- b) Write the **structure** of the **position isomer** of compound A and name the same.
- Q.15 Draw the following. (2)
- a) Lewis dot structure for **C₂H₂** Molecule
- b) Orbital picture of **Ethane** Molecule.

Section-C

- Q.16. Dihydrogen and Iodine react with each other to produce hydrogen iodide according to (3)
- the following chemical equation:

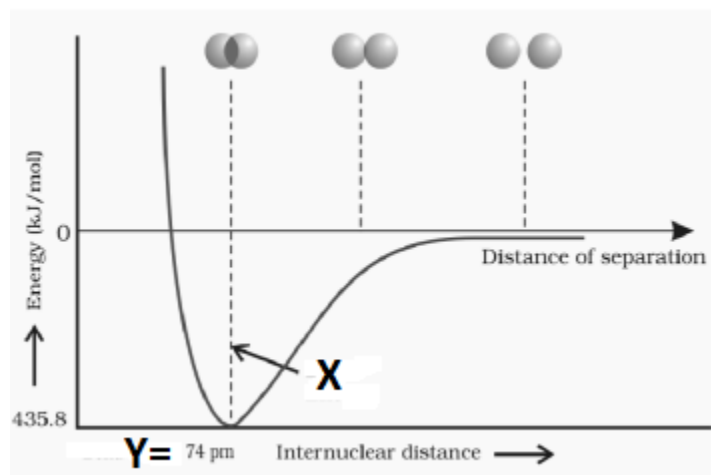


Write the information available from the above balanced chemical equation.

Calculate the mass of **One atom of Iodine** (Given atomic mass of Iodine=129 u)

- Q.17. Answer the following. (3)
- a) What is **photoelectric** effect?
- b) Light emitted from a source has a wavelength of 490nm. Calculate **frequency** and **wave number** of the light.
- Q.18 Answer the following. (3)
- a) Define **Heisenberg's uncertainty** principle.
- b) Write electronic configuration for **Mn** (Z=25)
- c) Draw a neat labelled diagram for **2p_x** orbital.

- Q.19 Answer the following questions with respect to graph which shows The potential energy curve for the formation of H₂ molecule as a function of internuclear distance of the H atoms. (3)



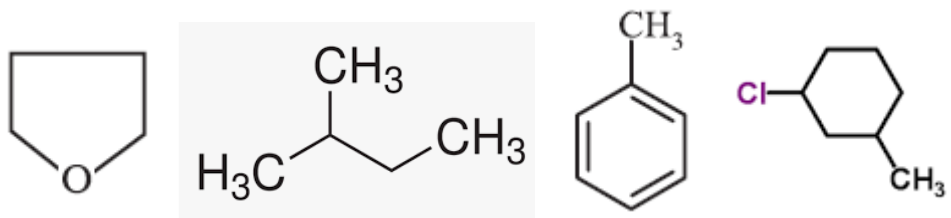
- Name the theory that graph tries to explain.
 - Why the curve initially decreases when internuclear distance decreases?
 - Why the curve shows high value of Potential energy below internuclear distance of 74 pm.
 - Label the “X” and “Y”.
- Q.20 State the **Charles** law. (3)

On hot days, you may have noticed that potato chip bags seem to “inflate”, even though they have not been opened. If you have a 250 mL bag at a temperature of 19 °C, and you leave it in your car which has a temperature of 60 °C, Calculate what will the new volume of the bag.

- Q.21 Define **Surface tension** and give reason for the following. (3)
- Viscosity** of liquids **decreases** as the temperature rises.
 - Liquids at high altitudes boil at **lower temperatures** in comparison to that at sea level.

- Q.22 Answer the following. (3)
- Write a complete chemical reaction of hydrogen with halogen.
 - Write one example each of ionic and covalent hydride.
 - Write a method used to remove temporary hardness of water.

- Q.23 Answer the following. (3)
- Write the structural formula for **carboxylic acid** and **amine**.
 - Amongst the following organic compounds, select and name the aromatic **benzenoid compound**.



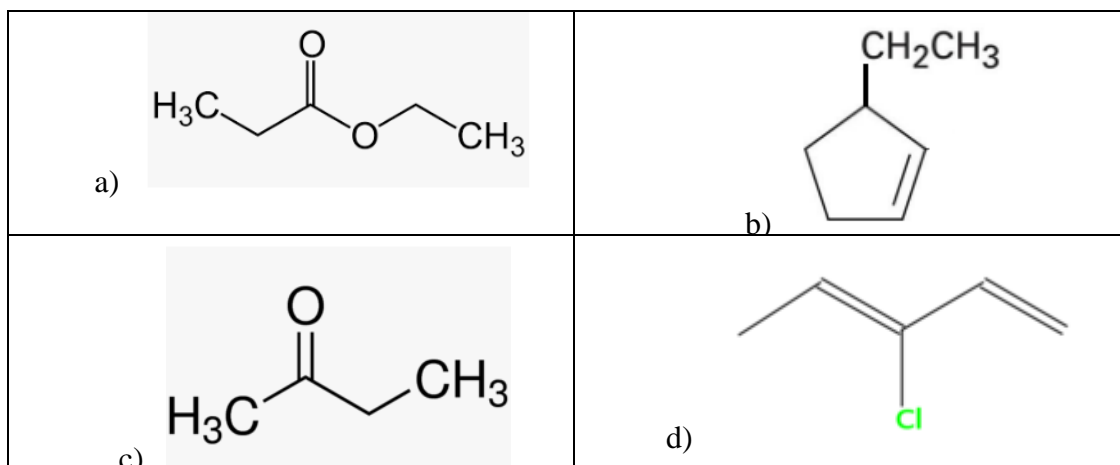
Section-D

- Q.24 With respect to **Dipole moment**, answer the following questions. (4)
- Define Dipole moment.
 - Write how it is designated (Symbol) and what is its unit.
 - Draw the structure of AlCl_3 molecule and show the bond dipoles in it.
 - Comment on net dipole moment in AlCl_3 with reason.

OR

- Q.24 With respect to NH_3 (**Ammonia**) molecule answer the following. (4)
- Define Hybridization.
 - Name the type of Hybridization that Nitrogen atom has undergone.
 - Write the number of lone pairs and bond pairs on Nitrogen atom.
 - Draw the orbital picture and comment on its geometry.

- Q.25 Write the IUPAC name of the following. (4)



OR

- Q.25 Write the structure for the following compounds. (4)
- 3-methylbutyne
 - Pentanenitrile
 - 2-ethylbutanamide
 - o-dibromobenzene

-----THE END-----