Shri Shantadurga Higher Secondary School, Bicholim Goa.

Class: - XI Science **Max Marks:- 55**

Day: – Tuesday **(Subject:-Chemistry)** **Date:- 18-10-2016**

Time: - 9.00 am. TO 11.30 am. **Duration: - 2 $\frac{1}{2}$Hours**

Total No of Questions: -5 **First Terminal Examination- 2016** **Total No Of Printed pages: 4**

Q No ***INSTRUCTIONS:*** **Marks**

(1) All questions are compulsory.

(2) Answer each main question on a fresh page.

(3) Figures to the right-indicate full marks.

(4) Use of calculators is not permitted, however mathematical tables will be provided on request.

(5) In case of Multiple choice question, complete the statement by choosing the correct alternative from those given below the statement and rewrite the completed statement:

Atomic masses & Constants:-H=1,K=39,N=14,O=16 , N_A*=6.023×*10^{23}*,*

Q 1 A Elements in the same group have same____________________ **1**

\# Density # Nuclear charge # Atomic radius # Number of valence electrons

Q 1 B Define the following terms and write their mathematical expression **3**

a) Mole fraction

b) Mass percentage

c) Molality

Q 1 C Calculate the mass of:- **2**

a) One atom of Potassium

b) One molecule of NH_3

Q 1 D State the following **3**

1. First law of Thermodynamics
2. Standard enthalpy of vaporization
3. Hess's law of constant heat summation.

Q 1 E Identify and group the following properties into **intensive** and **extensive** properties **2**

(temperature , pressure ,Mass , volume , enthalpy, viscosity)

Q 2 A The maximum number of electrons accommodated in 3d orbital is _____________ **1**

3 # 10 # 14 # 30

Q 2 B Answer the following. **3**

a) State Pauli’s exclusion principle

b) Write the detailed electronic configurations for the atoms of the following elements:

i) Ca (Z=20) ii) Cu (Z=29) iii) S (Z=16) iv) Si (Z=14)

Q 2 C **3**

a) Draw the shape of d_{yz} orbital.

b) Explain, giving reasons, which of the following sets of quantum numbers are not possible.

I. $\mathbf{n = 1, l = 0, m_l = 0, m_s = -\frac{1}{2}}$

II. $\mathbf{n = 1, l = 0, m_l = 1, m_s = +\frac{1}{2}}$

III. $\mathbf{n = 2, l = 1, m_l = 0, m_s = -\frac{1}{2}}$

IV. $\mathbf{n = 3, l = 3, m_l = -3, m_s = +\frac{1}{2}}$

Q 2 D Answer the following. **2**

I. Define Electronegativity of an element
II. The first ionization enthalpy of Oxygen is low compared to that of Nitrogen. Give reason.

Q 2 E Answer the following. **2**

I. Write two examples of species which are isoelectronic with Mg^{2+}
II. F^- ion has a larger radii than F atom. Give reason.

Q 3 A At constant volume, pressure of a fixed amount of a gas varies directly with the temperature, is___________________ **1**

Charles' law #Gay Lussac's law # Avogadro law # Boyle's law

Q 3 B Name the different types of van-dar-waals forces and write any three physical properties of gaseous state. **3**

Q 3 C Derive Ideal gas equation. **2**

Q 3 D Solve the following. **3**

1. It is hard to begin inflating a balloon. A pressure of 800.0 Kpa is required to initially inflate the balloon to 225.0 mL. What is the final pressure when the balloon has reached its capacity of 1.2 L?
2. What is the temperature at which 80 cm^3 of a gas should be heated to increase its volume by 20% without changing the pressure? *(Given that the initial temperature of the gas is 25^oC)*

Q 3 E Draw the graph showing enthalpy diagram for Exothermic and Endothermic reactions **2**

Q 4 A A pi-bond is formed by the overlap of:_______________ **1**

- s-s orbitals
- s-p orbitals
- p-p orbitals in end to end fashion
- p-p orbitals in sidewise manner

Q 4 B Draw the structures of NH_3 and NF_3 and explain which out of the two has higher dipole moment. **2**

Q 4 C Draw the **3**

A. Lewis dot structure for each of the following molecules.

1) CCl_4 2) CO_2

B. Resonating structures of Ozone molecule.

Q 4 D Draw the Molecular diagram for O_2 Molecule and calculate its Bond order. **4**

OR

Q 4 D Draw the Molecular diagram for N_2 Molecule and calculate its Bond order. **4**

Q 4 E State the effect(increase/decrease) of the following processes on the total **energy** content of the system **1**

(i) Work done by the system

(ii) Heat transferred to the surroundings

Q 5 A The aromatic compound among the following is __________________ **1**

- Cyclohexene
- Cyclopentene
- Benzene
- Cyclohexane

Q 5 B Answer the following. **2**

a. Write a point of difference between Homolytic fission and Heterolytic fission.

b. Classify the given below species as Nucleophile and electrophile

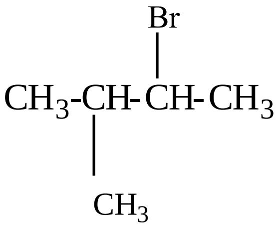
BF_3,H_2O,NH_3 and H^+

Q 5 C Write an example representing below given isomerism. **3**

i. Position isomerism
ii. Chain isomerism
iii. Functional isomerism

Q 5 D Write the IUPAC names for the following compounds **4**

1. $CH_3\text{-}CH_2\text{-}OH$
2. $CH_3\text{-}CHO$
3. CH_3COCH_3



$CH_3\text{-}\underset{\underset{CH_3}{|}}{CH}\text{-}\overset{\overset{Br}{|}}{CH}\text{-}CH_3$

4.

OR

Q 5 D Write the structures for the following compounds by rewriting their IUPAC names **4**

I. 3-ethyl-2-methylpentane
II. 2,2-Dimethylpropane
III. Cyclobutene
IV. Cyclopropane

Q 5 E Write the general formula for the following functional group **1**

I. Aldehyde
II. Cyanide

@@@