LIONS SCHOOL MIRZAPUR
HALF YEARLY EXAMINATIONS 2021-22
TERM -1

CLASS-XI TIME- 3 HOURS

SUB. CHEMISTRY M.M. 70

NOTE- (a) There are 33 questions in this question paper. All questions are compulsory.

(b) Section A : Q. No. 1 to 16 are objective type questions.

Q. No. 1 and 2 are passage based questions carrying 4 marks each while Q.No.3 to 16 carry 1 mark each.

(c) Section B : Q. No. 17 to 25 are short answer questions and carry 2 marks each.

(d) Section C : Q. No. 26 to 30 are short answer questions and carry 3 marks each.

(e) Section D: Q. No. 31 to 33 are long answer questions carrying 5 marks each.

Q. 1 Read the passage given below and answer the following questions: 1X4=4

In the periodic table electronegativity increases from left to right in a period and decreases

From top to bottom in a group. The non-metallic character of an element is directly related

To the electronegativity while the metallic character is inversely related to it .

The following questions are multiple choice. choose the most appropriate answer:

(i)The element with maximum electronegativity belongs to :-

(a) Period-1,Group-18 (b) Period-2, Group-17 (c) Period-3, Group-17 (d) Period-2, Group-1.

(ii) Which of the following groups contains metals, non-metals as well as metalloids ?

(a)Group-1 (b) Group-17 (c) Group-14 (d) Group-2 .

(iii) The least metallic element of group-13 is :

(a) Aluminium (b) Boron (c) Gallium (d) Indium

(iv) The electronegativity increases with-

(a)Decrease in nuclear charge (b) Increase in atomic mass

(c) Decrease in atomic size (d) Increase in atomic number

Q.2 Read the passage given below and answers the following questions: 1X4=4

Chemical bonding refer to formation of chemical bond between two or more atoms, molecule Or ion give rise to a chemical compound. Number of bond between two atm in molecule is called its bond order. There are different theories to explain bonding and structure of molecule.

The following questions are assertion-reason type. Choose the correct option out of the

Following choice for the question no. (i) to (iv) .

(a)Assertion and reason both are correct statements and reason is correct explanation for

Assertion .

(b) Assertion and reason both are correct statements but reason is not correct explanation

For assertion

(c) Assertion is correct statement but reason is wrong statement.

(d) Assertion is wrong statement but reason is correct statement.

(i) Assertion : Potassium is stronger reducing agent than sodium.

Reason : Ionization enthalpy of potassium is less than that of sodium.

(ii) Assertion: Bond order can assume any value including zero

Reason : Bond Order is Number of chemical bonds between a pair of atom.

(iii) Assertion: Molecular Nitrogen is less reactive than Molecular Oxygen.

Reason : Bond length of molecular nitrogen is shorter than molecular Oxygen.

(iv) Assertion :The dipole moment help to predict the molecule is polar or not.

Reason :Dipole moment help to predict the geometry of molecule

Following questions (no. 3-16) are multiple choice questions 1X14=14

Q.3 The oxidation number of Cl in Cl_2O_7 is

(a) +7 (b) +5 (c) +3 (d) -7

Q.4 Oxidation number of C in diamond is

(a) +4 (b) 0 (c) -4 (d) 2

Q.5 The general formula of alkane group is

(a) $C_n H_{2n+2}$ (b) C_nH_{2n} (c) C_nH_{2n-2} (d) C_nH_{2n+1}

Q.6 The shape of ClO_3^- ion is

(a) Tetrahedral (b) Pyramidal (c) Trigonal planar (d) Trigonal bipyramidal

Q.7 The highly metallic element will have the configuration of-

(a) 2,8,7 (b) 2,8,8,5 (c) 2,8,8,1 (d) 2,8,2

Q.8 The ratio of sigma and pie bonds in benzene is:-

(a) 2 (b) 6 (c) 4 (d) 8

Q.9 The number of atom in 0.1 mole of a triatomic gas is

(a) 1.8×10^{22} (b) 6.026×10^{22} (c) 1.806×10^{23} (d) 3.6×10^{23}

Q.10 The element with the highest ionization enthalpy is:-

(a) Oxygen (b) nitrogen (c) carbon (d) boron

Q.11 The correct configuration of Cu is:-

(a) $(Ar)4s^1$ (b) $(Ar)4s^2$ (c) $(Ar)3d^{10}4s^1$ (d) $(Ar)3d^9 4s^2$.

Or

The atomic orbitals are progressively filled in order of increasing energy. This principle is called:-

(a) Hund's rule (b) Aufbau principle (c) de Broglie rule (d) Pauli exclusion principle.

In the following questions (Q. No. 12-16) a statement of assertion followed by a statement of

Reason is given. Choose the correct answer out of the following choices.

(a)Assertion and reason both are correct statements and reason is correct explanation for

Assertion.

(b) Assertion and reason both are correct statements but reason is not correct explanation

For assertion

(c) Assertion is correct statement but reason is wrong statement.

(d) Assertion is wrong statement but reason is correct statement.

Q.12 Assertion: Carbon exhibits catenation to maximum extent.

Reason: Valency of carbon is 4.

Q.13 Assertion: Ethane and propane are homologous.

Reason: Ethane and propane both are alkanes.

Q.14 Assertion: Among halogens fluorine is the best oxidant.

Reason: Fluorine is the most electronegative atom.

Q.15 Assertion: the decomposition of hydrogen peroxide to form water and oxygen is an

Example of disproportionation reaction.

Reason: The oxidation state of oxygen changes from -1 to -2 and zero in the products.

Q.16 Assertion: Hydrogen oxidises lithium to LiH.

Reason: Hydrogen cannot act as oxidizing agent.

Q.17 Determine the molecular formula of an oxide of iron in which the mass percentage of iron

And oxygen are 69.9 and 30.1 respectively.

2

Q.18 Write the differences between orbit and orbital.
2

Q.19 Explain- (i) de Broglie equation .
2

(ii) Pauli’ principle.

Q.20 (a) what is the basic differences in approach between Mendeleev's periodic law and the

Modern periodic law?

(b) In terms of period and group where would you locate element with z=114? 1+1=2

Q.21 What do you understand by (i) electron deficient (ii) electron precise. Provide

Justification with suitable example.
2

Or

What do you understand by the term auto-protolysis of water? What is its significance?

Q.22 What is Law of Multiple Proportion, explain with two examples.
2

Q.23 Discuss Hund rules of maximum multiplicity.
2

Q.24 What are the necessary conditions for any compound to show aromaticity?
2

Or

Draw the cis and trans structures of hex-2-ene. Which isomer will have higher b.p. and

Why?

Q.25 How many sigma and pie bonds are found in 2,2-Dimethylpropane and

2,3-Dimethylbut-1ene?
2

Q.26 Discuss the purification of water by ion exchange resin method.
3

Q.27 The longest wavelength doublet absorption transition is observed at 589 and 589.6 nm . Calculate the frequency of each transition and energy differences between the two excited state. 3

Q.28 Explain the following:-
3

(i) Photo electric Effect (ii)Hydrogen economy (iii) Pauli exclusion principle

Q.29 Draw MO Energy level diagram for nitrogen molecule and find out it's bond order and magnetic properties.
3

Q.30 What are electrophile and nucleophile? Explain with examples.
3

Q.31 (a) Explain the structure of CO_3^{2-} ion in terms of resonance.

(b) Write the Lewis structures for the following molecules/ions:

H_2S, $SiCl_4$, BeF_2, ClO_3^-, HCOOH.

(c) Distinguish between a sigma bond and a pi bond.
5

Or

(a) Define hydrogen bonding. Is it weaker or stronger than the Van der Waals

Forces?

(b) What is hybridization? Explain sp^2 and sp^3 hybridization with one example of each.

(c) Discuss the shapes of the following molecules using VSEPR model:

H_2S, PH_3

Q.32 Give condensed and bond line structural formulas and identify the functional groups

Present. If any, for:
5

(a) 2,2,4-Trimethylpentane

(b) 2-Hydroxy-1,2,3-propanetricarboxylic acid

(c) Hexane dial

Q.33 Explain with the help of examples –
5

(a) Electron Affinity

(b) Free radical

(c) Coal gasification

(d) Disproportionation Reaction

(e) Carbanion

Or

Explain the following-

(a) position isomerism (b) functional group isomerism (c) inductive effect

(d) electrometric effect (e) hyper conjugation