CHEMISTRY (SCIENCE PAPER -2)

Answers to this Paper must be written on the paper provided separately.
You will NOT be allowed to write during the first 15 minutes.
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.
SECTION A is compulsory. Attempt **any four** questions from **SECTION B**.
The intended marks for questions are given in brackets [ ].

SECTION A

Attempt all questions from this section.

Question 1

Choose the correct answers to the questions from the given options:(Do not copy the questions,write the correct answer only)

(i) The lowest hypothetical temperature at which all molecular motion ceases is: **[1]**

(a) -273^0C (b) 273K (c) 273^0C (d) -273K

(ii) The chemical formula of Sodium chlorite is: **[1]**

(a) $NaClO_3$ (b) NaClO (c) $NaClO_2$ (d) $NaClO_4$

(iii) The electronic configuration of Ca^{2+} will be: **[1]**

(a) 2,8,8,2 (b) 2,8,8 (c) 2,8,2 (d) 2,8

(iv) An element which do not contain neutron is: **[1]**

(a) H (b) Li (c) Be (d) C

(v) The reduction in the amount of ozone in the stratosphere is called depletion of ozone and is caused by: **[1]**

(a) UV radiations (b) CFC compounds (c) Detergents (d) Cutting of trees

(vi) Which is not an effect caused due to ozone layer depletion? **[1]**

(a) Respiratory problems (b) Global warming (c) Skin cancer (d) Damage to automobile tyres

(vii) On moving across a period in the modern periodic table, the number of shells: **[1]**

(a) Remains the same (b) Increases (c) Decreases (d) Not definite

(viii) The salt which leaves black residue on heating: **[1]**

(a) $PbCO_3$ (b) $MgCO_3$ (c) $CaCO_3$ (d) $CuCO_3$

(ix) The pH range of acid rain is between: **[1]**

(a) 7 to 5.6 (b) 7 to 8.5 (c) 5.6 to 3.5 (d) 8.5 to 10

(x) An isotope of an element has: **[1]**

(a) Same physical properties (b) Diffferent chemical propertries

(c) Diffferent atomic number (d) Diffferent number of neutrons

(xi) Which noble gas has electronic configuration like that of Na^+? **[1]**

(a) Ar (b) Ne (c) He (d) Kr

(xii) A halogen whose atom has four shells is: **[1]**

(a) Cl (b) F (c) Br (d) I

(xiii) According to IUPAC in the modern periodic table, there are: **[1]**

(a) 8 groups (b) 18groups (c) 8 groups and one zero group (d) 7 groups and one zero group

(xiv) **Assertion (A) :** According to Mendeléev, the properties of elements are a periodic function of their atomic masses. **[1]**

Reason (R) : Atomic number is equal to the number of protons.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false. (d) A is false but R is true.

(xv) **Assertion (A) :** Magnesium belongs to 3rd period of modern periodic table. **[1]**

Reason (R) : The valence electrons of magnesium is 2.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false. (d) A is false but R is true.

Question 2

(i) Study the following table and answer the questions that follows: **[5]**

Particles	Electrons	Protons	Neutrons
W	2	3	4
X	10	10	10
Y	8	8	8
Z	8	8	10

(a) Write the mass number of particle W.

(b) Write the electronic configuration of X.

(c) Select a pair of isotopes.

(d) Define isotopes.

(e) Write the atomic number of Z.

(ii) Identify the substances A, B, C, D and E in each case, based on the information given below: **[5]**

(a) An orange coloured substance ‘C' which on heating turns to green voluminous mass with flashes of light.

(b) A crystalline blue coloured substance ‘D' which turns to white powder on heating.

(c) A compound ‘E' which turns yellow on heating and becomes white on cooling.

(d) The noble gas 'A' used in nuclear reactors.

(e) The gas 'B' which turns limewater milky.

(iii) State one relevant observation for each of the following: **[5]**

(a) When flame test is conducted with calcium salt.

(b) When carbon dioxide is passed through lime water first a little, then in excess.

(c) When a piece of zinc is dropped in hydrochloric acid.

(d) When dilute sulphuric acid is poured over solid sodium carbonate.

(e) When water is poured over white anhydrous copper sulphate.

(iv) Name the following: **[5]**

(a) A gas which has foul smell and turns lead acetate paper black.

(b) A gas which turns moist starch iodide paper blue black.

(c) The displaced product when zinc reacts with copper suplate solution.

(d) The gas with the smell of burning sulphur.

(e) The gas which burns with pop sound..

(v) Match the following: **[5]**

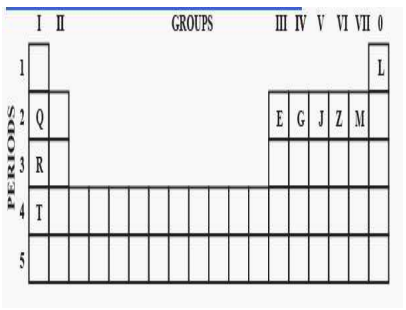
Column A	Column B
(a) A solid non metal of valency 3	(1) 6
(b) A gas of valency 2	(2) 14
(c) A metal with one electron in N shell	(3) 8
(d) A metalloid of valency 4	(4) 15
(e) An element with 4 electrons in valence shell	(5) 19

SECTION B (40 Marks)

(Answer any four questions from this Section)

Question 3

(i) Use the letters only written in the Periodic Table given below to answer the following questions : **[4]**



(a) State the number of valence electrons in atom J.

(b) Which element shown forms ions with a single negative charge?

(c) Which metallic element is more reactive than R?

(d) Which element has it's electrons arranged in four shells?

(ii) State charles Law. What is the need of kelvin scale of temperature? **[2]**

(iii) Fill in the blanks: **[4]**

(a) ..... gas prevents the harmful..... rays comming from sun.(C02/O3)

(b) In a group an element with largest atomic size will be placesd at the ..... of the group(top/bottom)

(c) Absolute zero is the term related to .....(pressure/temperature/volume)

Question 4

(i) At 0°C and 760 mm Hg pressure, a gas occupies a volume of 100 cm^3. The Kelvin temperature of the gas is increased by one-fifth while the pressure is decreased by one fifth times. Calculate the final volume of the gas. **[3]**

(ii) For the formation of ammonia molecule: **[3]**

(a) Write electronic configuration of atoms involved.

(b) How many electrons are needed by the atoms to attain nearest inert gas configuration.

(c) Draw the orbital diagram for the formation of ammonia molecule.

(iii) What is Mendeleev's periodic law? How modern periodic law is different from it? **[2]**

(iv) Differentiate between groups and periods. **[2]**

Question 5

(i) In the modern periodic table, identify the element which has: **[4]**

(a) Two shells, both of which are completely filled with electrons?

(c) A total of three shells, with four electrons in its valence shell?

(d) A total of two shells, with three electrons in its valence shell?

(e) Twice as many electrons in its second shell as in its first shell?

(ii) Write your observations when dilute sulphuric acid is added to the following: **[4]**

(a) A metal (b) A metal carbonate

(c) A metal sulphide (d) A metal sulphite

(iii) State wether the following reactions are oxidation or reduction: **[2]**

(a) $Cu \rightarrow Cu^{2+} + 2e^-$

(b) $Cl^- \rightarrow Cl$

Question 6

(i) How would you distinguish between the following pairs of substances on the basis of the chemical tests given in brackets? **[4]**

(a) Sodium Chloride and Potassium Chloride (flame test)

(b) Zinc nitrate and lead nitrate (dry heating)

(ii) Draw the formation of the following ion by showing the complete diagrammatic **[2]**

sketches of the atom and the ion.

$Cl \rightarrow Cl^-$

(iii) A steel cylinder of 60 litre capacity contains a gas under a pressure of 20 atmosphere pressure.How many cylinders of 800 ml capacity at constant temperature can be filled from it at a pressure of 1 atm of mercury? **[2]**

(iv) Name the law which you have applied to solve the above question and write its definition. **[2]**

Question 7

(i) Define the following: **[3]**

(a) Green house effect (b) Periodicity (c) Ozone depletion

(ii) Write chemical formula for the following: **[3]**

(a) Aluminium hydroxide (b) Ferric chloride (c) Copper sulphate

(iii) Balance the following chemical equations: **[4]**

(a) $NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$

(b) $Zn + KOH \rightarrow K_2ZnO_2 + H_2$

(c) $N_2 + H_2 \rightarrow NH_3$

(d) $Ca + N_2 \rightarrow Ca_3N_2$

Question 8

(i) Write the valency and representation of the following radicals: **[4]**

(a) Carbonate (b) Sulphate (c) Oxide (d) Chloride

(ii) Calculate the relative molecular masses for the following: **[2]**

(a) $CuSO_4.5H_2O$ (b) $(NH_4)_2SO_4$

(iii) Give the empirical formula of: **[2]**

(a) C_6H_6 (b) H_2O_2

(iv) Write the chemical names of the following: **[2]**

(a) $KHSO_4$ (b) K_2SO_3

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