Simran Singh XI-B

MODERN CONVENT SCHOOL

Sector – 4, Dwarka, New Delhi- 78

HALF YEARLY EXAM (2017-2018)

SET-2

Class: **XI**
Subject: **Chemistry (043)**

Time: **3 Hours**
M.M.: **70**

Note:

i. All questions are compulsory.
ii. Q.No. 1 to 5 are of one mark each.
iii. Q.No. 6 to 10 are of two marks each.
iv. Q.No. 11 to 22 are of three marks each.
v. Q.No. 23 is of four marks.
vi. Q.No. 24 to 26 are of five marks each.

Q1. Express the following to three significant figures:
(i) 4.358
(ii) 52.216

Q2. Calculate the number of atoms in 74 gm of He.

Q.3. An electron is present in 5p subshell. Write the possible values for all the quantum numbers.

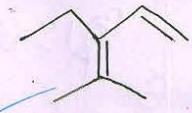
Q.4. An atom has 2K, 8L, 7M electrons. Indicate in it:
(i) Number of subshells
(ii) Number of unpaired electrons

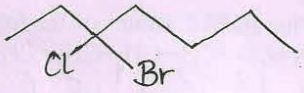
Q.5. Draw the structure of the compound whose IUPAC name is:
4-Chloro-3-methyl-but-2-en-1-ol

Q.6. Calculate the uncertainty ~~in position~~ of a moving ball with mass equal to 150 gm, if the uncertainty in its position is 1 A^0.

Q.7. Write the period, block and group for each of the following elements:
(i) Element X (atomic number = 12)
(ii) Element Y (atomic number = 26)

Q.8. Write the IUPAC names of the compounds, whose bond line notations are:

(i) 

(ii) 

Q.9. Mention one activity we do in our day to day life, that leads to environmental pollution. Suggest one measure that should be adopted to safeguard the environment from this kind of pollution.

Q.10. What do you mean by Ozone hole? What are its consequences?

Q.11. Carbon and hydrogen combine to form two compounds A and B. The percentage of hydrogen in these compounds is 25 and 14.3 respectively. Show that these results are in agreement with the Law of multiple proportions.

Q.12. An organic compound has Na= 14.31%, S= 9.97 %, H= 6.22% and the remaining is oxygen. Calculate the empirical formula of the compound. If the molecular mass of the compound is ~~612,~~ 644 what will be its molecular formula?

Q.13. The wavelength of the first line in the Balmer series is 656 nm. Calculate the wavelength of the third line. Mention the region of electromagnetic spectrum to which this radiation belongs to.

Q.14. Using an example, explain Covalent radius. Draw a neat diagram to represent it.

Q.15. (i) Write the name and symbol of the element with atomic number 126.
(ii) Write two species that are isoelectronic with S^{2-} ion.
(iii) Write the general electronic configuration of p-block elements.

Q.16. For an C_2 molecule :
(i) Write the LCAO series, by filling electrons in the suitable orbitals.
(ii) Draw the molecular orbital energy level diagram.
(iii) Calculate the bond order and mention the magnetic behavior.

Q.17. Show hybridization in Ethyne molecule diagrammatically, by writing the ground and excited state of the central atom. Also mention how many sigma and pi bonds are formed as a result of hybridization.

Q.18. (i) Why does the geometry of H_2O molecule gets distorted?
(ii) What is its new shape and bond angle?
(iii) Write its Lewis representation.

Q.19. (i) Calculate the formal charge of P atom in H_3PO_4 molecule.
(ii) What is the actual shape of a molecule of the type AB_4E, where E represents the lone pairs of electrons.
(iii) Through suitable representation, analyse if the BeF_2 molecule is polar or non-polar?

Q.20. Write the IUPAC names of the following:
(i) $CH_3–CH(Br)–CH(OH)–CH(Cl)–CH_2–CH_3$
(ii) $CHO–CH_2–CH=CH–CHO$
(iii) $CH_3–CH_2–CH(CH_2OH)–CH_2–CH(CH_2CH_3)–CH_3$

Q.21. (i) Explain Chain isomerism.
(ii) Write all the possible chain isomers of $C_6H_{13}OH$.
(iii) Mention the IUPAC names of the isomers.

Q.22. (i) Explain Negative Inductive effect, using an example.
(ii) Define Nucleophiles and give an example of a charged and neutral nucleophile.

Q.23. Reeta visits different villages and educates people about cleanliness and pollution. She encourages them to put vegetables and fruit peels and other domestic waste in compost pit. She also informs villagers about the hazards caused due to dirty and polluted water and guides them to keep the rivers and ponds clean. She motivates the villagers to make more and more use of solar energy.

Read the passage given below and answer the value based questions that follow :

(i) How can domestic waste be used as manure?
(ii) List two major causes of water pollution.
(iii) How can use of solar energy solve our problems?
(iv) Mention two values possessed by Reeta.

Q.24. Answer the following question (2+3) :
(i) Calculate Molarity of 20% (w/w), aqueous KI solution if the density of solution is 1.202 gm ml^{-1}.
(ii) Define Wavelength. $4*10^{16}$ photons of a certain light radiation are found to produce 2.3 J of energy. Calculate the wavelength of light radiation.

OR

(i) Define Limiting reagent. Calculate the amount of CO_2 that could be produced when 2 moles of carbon are burnt in 16 gm of dioxygen.
(ii) Write electronic configurations of the following and in each case mention the number of unpaired electrons:
(a) Cr (Z=24)
(b) Zn^{2+} (Z= 30)
(c) S^{2-} (Z= 16)

Q.25. Answer the following questions (2+3) :
(i) From the elements Fluorine (F), Carbon (C), Cesium (Cs), Chlorine (Cl) choose the following:
(a) The element with lowest ionization enthalpy.
(b) The element with smallest atomic radius.
(c) The element with highest negative electron gain enthalpy.
(d) The element which forms the largest number of compounds.
(ii) Explain Intermolecular and Intramolecular Hydrogen bonding, giving suitable example of each category.

OR

(i) (a) Out of Li^{+}, Be^{2+} and B^{3+} ions, which has the smallest ionic radius and why?

(b) Out of Br and I which has the more negative electron gain enthalpy and why?

(ii) Compare the polarity of NH_3 and NF_3 molecule, by drawing structures of both and giving specific reasons.

Q.26. Answer the following questions (2+3) :

(i) Define Green chemistry. How will it help decrease environmental pollution?

(ii) Explain Positive Resonance effect, by drawing all the resonance structures of aniline. Name two more groups which show +R effect.

OR

(i) Statues and monuments in India are affected by acid rain. How?

(ii) Explain Negative Resonance effect, by drawing all the resonance structures of Nitrobenzene. Name two more groups which show -R effect.