INDIAN SCHOOL SOHAR
FIRST TERM EXAM
CHEMISTRY

STD: XI MARKS: 70
Date:12-09-2017 TIME: 3Hrs

Instructions:

1. *All questions are compulsory.*
2. *Question nos. 1-5 are very short answer questions and carry 1 mark each.*
3. *Question nos. 6-10 are short answer questions and carry 2 marks each.*
4. *Question nos. 11-22 are short answer questions and carry 3 marks each.*
5. *Question no. 23 is short answer question and carry 4marks.*
6. *Question nos. 24-26 are long answer questions and carry 5 marks each.*
7. *Write serial no. of the question before attempting it.*
8. *Use log tables for calculations.*

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1. When the electron in hydrogen atom jumps from fifth energy level to third energy level, in which region of the electromagnetic spectrum the spectral lines are obtained. Name the series.

2. What is meant by Zeeman effect?

3. Write the IUPAC name and symbol of the element with atomic number 109.

4. Why is formula mass used instead of molecular mass for ionic compounds?

5. Define mole fraction.

6. In which of the following set of quantum numbers an electron will have the highest energy?
   a) 3, 2, 1, 1/2 b) 4, 2, -1, -1/2 c) 4, 1, 0, -1/2 d) 5, 0, 0, 1/2. Justify.

7. Boron has two isotopes B-10 and B-11. The average atomic mass of boron is found to be 10.8 u. Calculate the percentage abundance of these isotopes.

8. Write the electronic configuration of the element A with atomic number 37 and predict the period, group and block to which it belongs to?

9. What is meant by shielding effect? How does it affect the ionization enthalpy? Explain.

   OR

   State Modern periodic law. Explain why atomic number is a better property to classify elements.

10. What volume of 10M HCl and 3M HCl should be mixed to get 1 L of 6M HCl?

11.a) How does change in velocity of a moving particle alter the wavelength of the particle. What is this equation called? Write the equation.
   b) Give the number of radial nodes for 3s and 2p orbitals.
   c) An element has electronic configuration [Ar] $3d^5$ in its +3 oxidation state. Write the electronic configuration of its atom and predict the atomic number of the element.

12.a) Which has higher negative electron gain enthalpy : N or O and why?
   b) Write the atomic number of the element present in the fifteenth group and third period of the Periodic table.
   c) Out of metallic and covalent radius, which one is larger and why?

13.a) What is wave number? Write the expression relating wave number and frequency.

b) Calculate the wave number of the spectral line having frequency 4.5×10^{16} Hz.

(Velocity of light $c = 3 \times 10^{8} ms^{-1}$)

14.a) Write the electronic configuration of chromium. (Z =24)

b) Explain why half -filled and completely filled subshells are more stable configuration?

15. State Heisenberg's Uncertainty Principle. Why did Heisenberg's Uncertainty Principle replace the concept of definite orbits by the concept of probability?

OR

What information does Azimuthal quantum number and spin quantum number give about an electron? Explain

16. Account for the following:

a) Noble gases have largest atomic size in their respective periods.

b) Second ionization enthalpy of Na (Z=11) is more than that of Mg (Z=12).

c) Size of cation is smaller than its parent atom.

17.a) Calculate the number of atoms present in 0.2 mole molecules of nitrogen. (At mass of N = 14)

b) Calculate the number of molecules in a drop of water weighing 0.05 g. If the drop evaporates in one hour, how many water molecules leave the liquid surface in one second?

18. Two flasks of equal capacity contain NH_3 and SO_2 gas under similar conditions. Which flask has more number of moles? Which law is applicable here? State the law. Which flask has more mass

19.a) Define limiting reagent.

b) Calculate the mass of 60% HC*l* (by mass) is required to completely react with 0.2 mol of zinc? What volume of hydrogen will be produced at STP according to the reaction :

$Zn + 2HCl \longrightarrow ZnCl_2 + H_2$ (Atomic mass of H =1, Cl = 35.5, Zn = 65)

20. Arrange the following in the increasing order of their property mentioned:

a) F, Cl, Br (negative electron gain enthalpy)

b) P, S, Cl (ionization enthalpy)

c) P^{3-}, S^{2-}, Cl^{-} (ionic size)

21.a) What is the difference between the terms electron gain enthalpy and electronegativity?

b) Among alkali metals which element do you expect to be least electronegative and why?

22. A 0.005 cm thick coating of copper is deposited on a plate of 0.5 m^2 area. Calculate the number of copper atoms deposited on the plate given density of copper is 7.2 g/cc and atomic mass is 63.5

23. We all belong to family which is most important in our life. Mr. Ashok lives in a joint family along with his parents and his children. Mr. Ravi lives in a nuclear family. In the similar way, elements in the Periodic table are arranged in groups and periods in a systematic manner.

After reading the above passage, answer the following questions:

a) What is the need to classify elements?

b) On what basis did Mendeleev classify elements. What are the drawbacks of Mendeleev's periodic table?

c) What are the advantages of living in a joint family?

d) What values are possessed by Mr. Ashok?

24.a) Write the postulates of Planck's Quantum theory.

b) 3×10^{18} photons of a certain light radiation are found to produce 1.5 J of energy. Calculate the wavelength of the light radiation. ($h = 6.6 \times 10^{-34}$JS)

OR

a) What are the observations made during photoelectric effect?

b) If the threshold wavelength for producing photoelectric effect is $2000A^{o}$, then what wavelength of light will be required to produce photoelectrons with double the kinetic energy of those produced by light of wavelength $1500A^{o}$?

25. Explain the three principles used in writing the electronic configuration of elements with suitable examples.

OR

Write three important postulates of Bohr's model of an atom? How could Bohr's model explain the existence of so many lines in the spectrum of hydrogen?

26.a) Define ionization enthalpy. How does it vary across the period? Explain exceptional cases.

b) Comment on the statement that 'all elements having high ionization enthalpies will have high negative gain enthalpies'.

OR

a) What is meant by periodicity in properties? What is it due to?

b) Write the general outer electronic configuration of s and p block elements. How do they differ in their properties. Explain.