INDIAN SCHOOL SOHAR
UNIT TEST 2014-2015
CHEMISTRY

STD: XI   MARKS: 50

Date:20-05-2014   TIME: 2 Hrs

Instructions:

1. *All questions are compulsory.*
2. *Question nos. 1-2 are very short answer questions and carry 1 mark each.*
3. *Question nos. 3-6 are short answer questions and carry 2 marks each.*
4. *Question nos.7-16 are short answer questions and carry 3 marks each.*
5. *Question nos. 17-18 are long answer questions and carry 5 marks each.*
6. *Write serial no. of the question before attempting it.*
7. *Use log tables for calculations.*

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1. Na and Mg^+ have the same number of electrons but removal of electron fron Mg^+ requires more energy. Why?

2. An element X belongs to the third period of the p block. It has four electrons in the outermost shell. Identify the element and the group to which it belongs?

3. An atom of an element has 2K, 8L, 9M and 2N electrons. Write the electronic configuration and find   a) total number of s electrons   b) total number of p electrons   c) total number of d electrons d) number of unpaired electrons

4. What do you understand by the term formula mass? How does it differ from molecular mass?

5. Calculate the number of oxalic acid ($H_2C_2O_4.2H_2O$) molecules in 100ml of 0.02M oxalic acid solution. (Atomic mass of H=1, C=12, O=16 $gmol^{-1}$)

6. Zinc and hydrochloric acid react according to the reaction : $Zn + 2HCl \longrightarrow ZnCl_2 + H_2$
   If 0.3mol of Zn is added to HCl solution containing 0.52mol of HCl, calculate the number of moles of H_2 produced? Identify the limiting reagent and calculate the amount of one of the substance that remains unreacted. (Atomic mass of Cl=35.5, Zn= 65$gmol^{-1}$)

7. a) Define   i) quantum   ii) black body
    b) On what does the energy of quantum depend ? What is this equation called?

8. The wavelength of the first spectral line of Balmer series is 6500A^o. What is the wavelength of the second spectral line of Balmer series? (R= 1.097x10^7 m^{-1})

<div align="center">OR</div>

Calculate the shortest wavelength in hydrogen spectrum of lyman series.

9. The electronic configuration of few elements are given below:

   i) $1s^2 2s^2 2p^6 3s^2 3p^2$ ii) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^1 4s^2$ iii) $1s^2 2s^2 2p^6 3s^1$ iv) $1s^2 2s^2 2p^6$
   Which of these a) is an alkali metal   b) has lowest chemical reactivity
                        c) is a transition element   d) belongs to group 14 of the periodic table
                        e) belongs to third period.

10.a) Define ionization enthalpy.
   b) How does ionization enthalpy vary across the period? Account for your answer
      and explain exceptional cases if any.

11. Calculate the number of atoms in each of the following:
      a) 52moles of He   b) 52u of He   c) 52g of He   (Atomic mass of He = 4gmol^{-1})

12. What are the demerits of Bohr's model of an atom? Explain

13. a) Differentiate between empirical and molecular formula.
    b)An organic compound on analysis gave the following % compositions: C = 68.75, H = 4.8,
       O = 26.45. If the molecular mass of the compound is 122, determine the molecular formula
       of the compound. (Atomic mass: H=1, C=12, O=16gmol^{-1})

14. a) State the law of multiple proportion\.
    b) Define   i) molality   ii) molefraction

15. State Heisenberg's uncertainty principle. How does de-Broglie's wave equation and
    Heisenberg's uncertainty principle raise objection to Bohr's theory?

OR

    a) Define photoelectric effect.
    b) Calculate the kinetic energy of the ejected electron when yellow light of frequency
       $5.2x10^{14}sec^{-1}$ falls on the surface of potassium metal. Threshold frequency of the metal
       is $5x10^{14}sec^{-1}$. (h= $6.6x10^{-34}$JS)

16. Account for the following:
    a) Halogens have highest negative electron gain enthalpy in their respective periods.
    b) Van der waals radius of an element is always larger than covalent radius.
    c) Second ionization enthalpy is more than first ionization enthalpy.

17. Explain the rules followed in the filling up of different orbitals of an atom with electrons
      giving suitable examples.

OR

    Write a note on the permitted values of quantum numbers and the significance of each
      quantum number.

18. a) Define   i) covalent radius ii) metallic radius
    b) How does atomic size vary across the period ? Explain .
    c) How does atomic size change when an atom gains an electron? Explain.

OR

    a) Explain the classification of elements in the periodic table into four blocks.

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