પુખ્ના International School

Shree Swaminarayan Gurukul, Zundal

HALF YEARLY (2020 - 21)					
Student's Name:		**Grade**	**XII Sci**	**Roll No.**	
Date:	**08/09/2020 (Tuesday)**	**Time**	**3 hrs.**	**Subject**	**Chemistry**
Teacher's Sign.				**Total Marks**	**80**

General instructions:

- **All questions are compulsory**
- **Questions No. 1 -5 are very short answer questions and carry one mark each.**
- **Question No 6-12 are short answer question and carry 2 marks each.**
- **Question No 13-24 are also short answer question and carry 3 marks each.**
- **Question No 25-27 are long answer question and carry 5 marks each.**
- **Use of log tables if necessary. Calculators are not allowed.**

1. Give an example which shows both frenkel and Schottky defect. [1]
2. Give the unit of conductance? [1]
3. What do you mean by the term –Adsorption ? [1]
4. What are the common oxidation states of this group? [1]
5. Write the general configuration of d- block elements. [1]

6. How many atoms are there in a unit cell of a metal crystallizing in a: [2]

   (a) FCC structure

   (b) BCC structure

7. A solution is prepared by dissolving 11g glucose in $200\ cm^3$ water at $30^0\ C$. What is the mass Percentage of glucose in solution? The density of water [2]

8. The molar conductivity of 0.1M CH3COOH solution is $4.6\ cm^2 mol^{-1}$. What is the conductivity and resistivity of the solution? [2]

9. What is the use of integrated rate equation? [2]
10. Write the four differences between physisorption and chemisorption? [2]
11. Draw the structure of following :-(i) PCl_5 (ii) H_3PO_3 [2]
12. Make the cis and trans forms of the complex $\left[Cr\ Cl_2 (en)_2 \right]^+$. Which one of these will be optically active? [2]
13. Aluminium crystallises in a cubic close-packed structure. Its metallic radius is 125 pm. [3]

    (i) What is the length of the side of the unit cell?

(ii) How many unit cells are there in 1.00 cm^3 of aluminium?

14. Copper crystallises into a fcc lattice with edge length $3.61\times10^{-8}cm$. Show that the calculated density is in agreement with its measured value of 8.92 g cm^3.
[3]

15. If the solubility product of CuS is 6×10^{-16}, calculate the maximum molarity of CuS in aqueous solution.
[3]

16. A chemical reaction 2A $\Leftrightarrow$ 4B+C in gas phase occurs in a closed vessel. The concentration of B is found to be increased by $5\times10^{-3}mole\ L^{-1}$ in 10 second. Calculate (i) the rate of appearance of B (ii) the rate of disappearance of A? [3]

17. The rate constant for a reaction is $1.5\times10^{7}s^{-1}$ at 50^0C and $4.5\times10^{7}s^{-1}$ at 100^0C.

Calculate the value of activation energy for the reaction $R=8.314\ JK^{-1}mol^{-1}$? [3]

18. Explain the following terms:

(i) Electrophoresis (ii) Coagulation(iii) Tyndall effect. [3]

19. Considering the parameters such as bond dissociation enthalpy, electron gain enthalpy and hydration enthalpy, compare the oxidising power of F_2 and Cl_2. [3]
20. How would you account for the irregular variation of ionization enthalpies (first and second) in the first series of the transition elements? [3]
21. Calculate the 'spin only' magnetic moment of $M^{2+}_{(aq)}$ ion ($Z = 27$). [3]

22. $[NiCl_4]^{2-}$ is paramagnetic while $[Ni(CO)_4]$ is diamagnetic though both are tetrahedral. Why?
[3]

23. Discuss the general characteristics of Group 15 elements with reference to their electronic configuration, oxidation state, atomic size, ionisation enthalpy and electronegativity.
[3]

24. What is an adsorption isotherm? Describe Freundlich adsorption isotherm. [3]
25. The rate of the chemical reaction doubles for an increase of 10 K in absolute temperature from 298 K. Calculate E_a. [5]

26. Explain on the basis of valence bond theory that $[Ni(CN)_4]^{2-}$ ion with square planar structure is diamagnetic and the $[NiCl_4]^{2-}$ ion with tetrahedral geometry is paramagnetic.
[5]

27. Give reasons :- [5]

(a) Oxygen molecule is diatomic where as sulphur molecule is polyatomic.

(b) The most common oxidation state of oxygen is -2.

(c) H2O is liquid whereas H_2S is gas at room temperature.

(d) The increasing order of acidic character in 16th group hydrides is

(e) SF_6 is exceptionally stable, SH_6 does not exist.