Modern International School

Manju

Half Yearly (2017-18)

Chemistry-Class XII

SET-B

TIME: 3 HOURS **M.M.: 70 MKS**

All questions are compulsory

1. **Questions 1-5 are very short answers of 1 marks each.**
2. **Questions 6-10 are short answer of 2 marks each.**
3. **Questions 11-22 are also short answers of 3 marks each.**
4. **Question 23 is a value based question and carries 4 marks.**
5. **Question numbers 24-26 are long answers of 5 marks each.**

1) What is the effect of Schottky defects on the density of the crystal?

2) What is antifreeze?

3) Why rate of reaction does not remain constant throughout?

4) Give one example of Micelles system?

5) What is Gangue? — 1

6) What do you mean by activity and selectivity of catalyst? — 2 reverse.

7) Compare the stability of +2 oxidation state of the elements of the first transition series.

8) Noble gases have very low boiling points. Why?

9) Bond angle in PH^{+}_{4} is higher than that in PH_3. Why?

10) Giving examples, differentiate between roasting and calcination. — 2

11) If the radius of the octahedral void is r and radius of the atoms in close packing is R, derive relation between r and R. — 3

12) Explain what is observed when

i) A beam of light is passed through a colloidal solution.

ii) An electrolyte Nacl is added to hydrated ferric oxide sol.

iii) An electric current is passed through a colloidal sol.

13) Distinguish between the following

i) Lyophilic and Lyophobic sols.

ii) Multimolecular and macromolecular colloids.

iii) Physical adsorption and chemical adsorption.

14) Heptane and octane form ideal solution. At 373 K, the vapour pressure of the two liquid components are 105.2 kpa and 46.8 kpa respectively. What will be the vapour pressure of a mixture of 26.0 g of heptane and 35g of octane?

15) i) Why is the extraction of copper from pyrite is difficult than that from its oxide through reduction?

ii) Describe the role of the following.

a) Limestone in the extraction of iron.
b) NaCN in the extraction of silver from silver ore.

16) Tungsten has the density of 19.35g cm^{-3} and the cell edge of unit cell is 316 pm. The unit cell in the most important crystalline form tungsten is the body centred cubic unit cell. Calculate the number of atoms present in 50g of the element.

17) Give reasons.

i) Solid PCl_5 is an ionic compound.

ii) Most of the reactions of fluorine are exothermic.

iii) Ozone is thermodynamically unstable.

18) Account for the following.

i) Chlorine water has both oxidising and bleaching properties.

ii) H_3PO_2 and H_3PO_3 act as good reducing agents while H_3PO_4 does not.

iii) On addition of ozone gas to KI solution, violet vapours are obtained.

19) The rate constant of a first order reaction becomes double when temperature changes from 27°C to 37°C. Calculate the activation energy of the reaction.

20) What is lanthanoid contraction? What are the consequence of lanthanoid contraction?

21) What is an adsorption isotherm? Describe Freundlich adsorption isotherm.

22) What are interstitial compounds? Why are such compounds well known for transition metals? 3

23) Gita observed that her mother got tired after doing every little work. She felt lethargic and did not have the energy to do work. She took her mother to a doctor. The doctor diagnosed her mother with pernicious anaemia. Gita helped her mother in house hold work till she recovered and took her care. 4

a) Name the vitamin whose deficiency caused pernicious anaemia.

b) Name the sources which will provide this vitamin.

c) Give the chemical name of this vitamin.

d) Mention the value shown by Gita.

24) i)

a) Indicate the steps in the preparation of $K_2Cr_2O_7$ from chromite ore.

b) What is the effect of change in pH on $K_2Cr_2O_7$ solution?

ii) Assign reasons for the following observations.

a) Cr^{2+} is reducing while Mn^{3+} is oxidising though both have d^4 configuration.

b) The enthalpy of atomisation of zinc is lowest.

c) Zn^{2+} salts are white while Ni^{2+} salts are blue.

25) i) Why do transition elements show variable oxidation states?

a) Name the elements showing maximum number of oxidation states among the first series of transition metals from Sc (Z=21) to Zn (Z=30).

b) Name the element which shows only +3 oxidation state.

ii) Compare actinides and lanthanides with reference to their

a) electronic configuration of atoms.

b) Oxidation states of elements.

c) General chemical activity of elements.

26) i) Two electrolytic cells containing silver nitrate solution and dilute sulphuric acid solution were connected in series. A steady current of 2.5 A was passed through them till 1.078 g of silver was deposited. (Ag= 107.8 $gmol^{-1}$, 1F= 96500c).

a) How much electricity was consumed?

b) What was the weight of the oxygen gas liberated?

ii) Give reasons

a) The equilibrium constant K is related to E^0 cell.

b) Conductivity of an electrolyte solution decreases with the decrease in concentration.

----------X----------