BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SESSION 2017-18
Sample paper-8

Class: XII Max Marks: 70
Subject: Chemistry Time Allotted: 3 hrs

General Instructions:

1. All questions are compulsory
2. Question numbers 1 to 5 are very short questions, each of 1 mark.
3. Question numbers 6 to 10 are short answer questions of 2 marks each.
4. Question numbers 11 to 22 are short answer questions of 3 marks each.
5. Question number 23 is value based question of 4 marks.
6. Question numbers 25 to 27 are long answer questions of 5 marks each.

---

1. What is Total no. of atoms per unit cell in fcc crystal structure?
2. Express the relation between the conductivity and molar conductivity of a solution?
3. Why is the froth floatation method selected for the concentration of sulphide ores?
4. Why is Bi(V) a stronger oxidant than Sb(V) ?
5. Write the structure of 2-Bromo-3-methylbut-2-en-1-ol.

6. What type of cell is lead storage battery? Write anode and the cathode reaction and the overall cell reactions occurring in the recharging of a lead storage battery.

7.Give the principle involved in following process:

(a) Mond's Process (b) Zone Refining

8. Complete the following chemical reactions:

i) $P_4(s) + NaOH(aq) + H_2O(l)$ --------→
ii) $I^- + H_2O(l) + O_3(g)$ ----------→

9. For the decomposition reactions the values of rate constant K at two different temperaturesgiven below: $K_1 = 2.15 \times 10^{-8}$ L mol^{-1} s^{-1} at 650K1

K_2 = 2.39X 10 -7 L mole $^{-1}$ s^{-1} at 700 K

Calculate the value of Ea for this reaction (R = 8.314 JK-1 mol-1)

10. Give explanation in support of the following observations:

a) Sulphuric acid has low volatility.

b) Oxoanions of a metal show higher oxidation state.

OR

a)Account for the following:

i) Oxidizing power in the series $VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$

ii) In the first transition series only Cu has positive electrode potential.

11. a) Calculate the charge in coulombs required for the oxidation of 2 mole of water to oxygen? (Given 1F = 96500 C/mol^{-1})

b) Zn/AgI oxide cell is used in hearing aids and electric watches where following reactions occur:

$Zn(s) \dashrightarrow Zn^{2+}(aq) + 2e^-$ $\quad E^0 (Zn^{2+}(aq)/ Zn = -0.76V$

$Ag_2S + H_2O + 2e \dashrightarrow 2Ag + 2OH^-$ $E^0(Ag^{+1}/Ag) = 0.344V$

Calculate the i) Standard potential of the cell ii) standard Gibb's energy.

12. Give reasons for the following observations:

a) Colloids stabilize due to Brownian movement.
b) Cottrell's smoke precipitator is fitted at the mouth of chimney used in factories.
c) Colloidal gold is used for intramuscular injection.

13. a) Write the Zwitter ion structure of glycine.

b) What is meant by inversion of sugar?

c) Name the vitamin in each case whose deficiency causes:

i) Night blindness ii) Poor coagulation of blood.

14. (i) Write chemical reaction for the following reactions:

a) Oxidation of oxalate ion by MnO_4^- in acidic medium.

b) Disproportionate of manganese (VI) in acidic medium.

(ii) What is the effect of increasing pH on dichromate ion with the help of structures.

15.Give plausible reason for each of the following:

a) p-nitrophenol is more acidic than p-methoxyphenol.

b) Alcohols are easily protonated in comparison to phenols

c) The relative ease of dehydration of alcohols is $3^0 > 2^0 > 1^0$ ..

16.a) Give one reaction of D-glucose which cannot be explained by its open chain structure.

b) Give one example each for the essential and non-essential amino acids .

c) Differentiate between keratin and insulin.

17. a) (i)Identify aliphatic biodegradable polyester which is used in packaging and orthopedicdevices.

(ii) Write its full form (name)

(iii) Give the structure of monomers from which it is formed.

b) Arrange the following in order of their increasing strength PVC, Nylon 66, vulcanized rubber.

18. (i) Justify why : Sleeping pills are recommended to patients suffering from sleeplessness but it is not advisable to take them without consulting the doctor.

(ii) Asprin belongs to which class of drugs?

(iii) Give constituents of Dettol.

19. A) Give chemical test to distinguish between :

i) Isopropyl alcohol and n-propylalcohol.
ii) Phenol and ethyl alcohol
iii) Methyl ethanoate and ethyl ethanoate.

20. (a) Give the one major difference between lyophillic and lyophobic colloids.
(b) Explain following terms:
(i) Sky appears blue in colour.
(ii) A freshly formed precipitate of ferric hydroxide can be converted to a colloidal sol by shaking it with a small quantity of ferric chloride.

21. In a hydrolysis reaction, 5 grams ethyl acetate is hydrolyzed in the presence of dilute HCl
in 300 minutes. If the reaction is first order and initial concentration of ethyl acetate is 22 gram/litre. Calculate the rate constant of the reaction.

22. (a) Write the IUPAC name for $[Co(en)_3]_2(SO_4)_3$
(b) How many geometrical isomers are possible in the coordination entity $[Co(NH_3)_3(NO_3)_3]$?
(c) Give the number of unpaired electrons in $[Ni(CN)_4]^{-2}$. (Atomic no of Ni = 27)

OR

Predict hybridization, shape, magnetic properties of hexachloridochromate(III)ion on the basis of VBT.

23. Mohan heard a lot of noise and weeping in nearby jhuggis .He took courage and went to inquire what had happened. He found that some people have taken spurious alcohol containing methanol and were crying with pain and were complaining of loss of eyesight. He immediately hired an auto rickshaw and packed it with 4 persons who have consumed spurious alcohol.

a. How does methanol in drinking alcohol cause problem?

b. What treatment might the doctors have undertaken to save the patients?
c. What message would you give to the person who consumed spurious alcohol?
d. What values had Mohan showed in this incident?

24. a)Methanol is a crystalline substance with peppermint taste. A 6.2% solution of methanol in cyclohexane freezes at -1.95 ^{0}C.Determine the formula mass of methanol. The freezing point and molal depression constant of cyclohexane are 6.5 ^{0}C and 20.2 K kg mol^{-1} respectively.

b) State Henry's law and mention its two applications.

c) Which of the following has higher boiling point and why? 0.1 M NaCl or 0.1 M Glucose.

OR

(a) Define azeotropes and explain briefly minimum boiling point azeotropes by takingsuitable examples.

b) The vapour pressure of pure liquid A and B are 450mm and 700 mm of Hg respectively at50 K .Calculate the composition of liquid mixture if total vapor pressure is 600mmof Hg .also find the composition of the mixture in vapour phase.

25. (i) Account for the following:

(a) Nitrogen gas is inert at room temp.

(b) F_2 is better oxidizing agent than Cl_2. Why?

(c) In aqueous solution HI is stronger acid than HCl.

(d) Noble gases have low boiling point.

(ii) Draw the structure of XeO_3

OR

(a) Write balanced equations for the following:

(i) Hydrolysis of Calcium Nitride.

(ii) The reaction of Cl_2 with hot and concentrated NaOH.

(iii) The reaction of platinum with aqua-regia

(b) Write the chemical equations involved in Brown ring test for nitrate ion.

26. (i) How will you bring about the following conversions

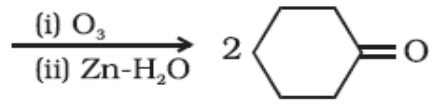
a) Propanone to prop-1-ene
b) Benzoic acid to benzaldehyde
c) Ethanal to 3-Hydroxybutanal

(ii) Complete the following reactions:-

a)

_____

b)

_____ 

OR

(a) An organic compound with the molecular formula $C_9H_{10}O$ forms 2,4-DNP derivative, reduces Tollens' reagent and undergoes Cannizzaro's reaction. On vigorous oxidation, it gives 1,2-benzenedicarboxylic acid. Identify the compound and give the chemical reactions involved.

(b) Predict the products formed when cyclohexanecarbaldehyde reacts with following reagents.

(i) PhMgBr and then H_3O^+

(ii) Zinc amalgam and dilute hydrochloric acid

Ms. Rani Garg