

BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SESSION 2017-18
Sample paper-3

Class: XII
Subject: Chemistry

Max Marks: 70
Time Allotted: 3 hrs

General Instructions:

1. All questions are compulsory.
2. Marks for each question are indicated against it.
3. Q.No. 1 to 5 are very short questions and carry one mark each.
4. Q.No.6 to 10 are short answer questions of 2 marks each.
5. Q.No.11 to 22 are also short answer questions and carry 3 marks each.
6. Q.No. 23 is value based question and carries 4 marks.
7. Q.No. 24 to 26 are long answer questions and carry 5 marks each.
8. Use log tables if necessary .Use of calculators is not permitted.

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|---|---|
| 1. Why are crystalline solids anisotropic? | 1 |
| 2. What are emulsions? Name an emulsion in which water is a dispersed phase. | 1 |
| 3. What are the collectors used in froth floatation process? Name a substance that can be used as such. | 1 |
| 4. Why is F ₂ a stronger oxidizing agent than Cl ₂ ? | 1 |
| 5. Name the alcohol that is used to make the following ester: | 1 |
| $\begin{array}{c} \text{O} \\ \\ \text{CH}_3\text{-C-O-CH-CH}_3 \\ \\ \text{CH}_3 \end{array}$ | |
| 6. Give a test to distinguish between propan-2-one and pentane-3-one. | 2 |
| 7. How does homopolymer differ from a copolymer? | 2 |
| 8. Define 'Peptide Linkage'. | 2 |
| 9. Set up Nernst equation for the standard dry cell. Using this equation show that the voltage of the dry cell has to decrease with use. | 2 |
| 10. How does the change in temperature affect the rate of reaction? How can this effect on the rate of constant of a reaction to be represented quantitatively? | 2 |
| 11. Describe the underlying principle of each of the following: | 3 |
| a) Recovery of Silver from the solution obtained by leaching silver ore with a solution of NaCN. | |
| b) Electrolytic refining of a crude metal. | |
| OR | |
| Describe the principle involved in each of the following processes: | |
| i) Zone refining of a metal | |
| ii) Vapour phase refining of metals. | |
| 12. Complete the following chemical reactions: | 3 |
| i) $\text{SO}_2 + \text{MnO}_4^- + \text{H}_2\text{O} \rightarrow$ | |
| ii) $\text{F}_2(\text{g}) + \text{H}_2\text{O} \rightarrow$ | |

13. Assign reasons for the following: 3
- i) Copper (I) ion is not known to exist in aqueous solutions
 - ii) Both O_2 and F_2 stabilize high oxidation states of transition metals but the ability of oxygen do not so exceeds that of fluorine
 - iii) SF_6 is chemically inert
14. Write the IUPAC names of the following compounds: 3
- i) $CH_2=CHCH_2Br$
 - ii) $(CCl_3)_3CCl$
 - iii) $CH_3CH_2-C-CH_2CH_3$
 $\quad \quad \quad \parallel$
 $\quad \quad \quad O$
15. What are the ambident nucleophiles? Explain with an example. 3
16. i) Arrange the following compounds in an increasing order of basic strength: 3
 $C_6H_5NH_2, C_6H_5N(CH_3)_2, (C_2H_5)_2NH$ and CH_3NH_2
- ii) Arrange the following compounds in a decreasing order of pK_b values
 $C_2H_5NH_2, C_6H_5NHCH_3, (C_2H_5)_2NH, C_6H_5NH_2$
 - iii) Arrange in increasing order of acidic character.
 $Cl-CH_2-COOH, F-CH_2-COOH, CH_3-COOH$
17. Give a chemical test to distinguish between each of the following pairs of compounds: 3
- i) Ethylamine and Aniline
 - ii) Aniline and Benzyl amine
 - iii)
18. Write the names and structures of monomers used for getting the following polymers: 3
- i) Buna – S
 - ii) Nylon – 6, 6
 - iii) Tereylene
19. Iron has a body centered cubic unit cell with a cell dimension of 286.65 pm. The density of iron is 7.874 g cm^{-3} . Use this information to calculate Avogadro's number. 3
 (Gram atomic mass of $Fe=55.84 \text{ gmol}^{-1}$)
20. For a decomposition reaction the values of k , at two different temperatures are given below: 3
- $$k_1 = 2.15 \times 10^{-8} \text{ L / (mol.s) at 650 K}$$
- $$k_2 = 2.39 \times 10^{-7} \text{ L / (mol.s) at 700 K}$$
21. Giving appropriate examples explain how the two types of processes of adsorption (Physisorption & chemisorptions) are influenced by the prevailing temperature, the surface area of adsorbent and the activation energy of the process? 3
22. Explain clearly how the phenomenon of adsorption finds application in 3
- i) Production of vacuum in vessel
 - ii) Heterogeneous catalysis
 - iii) Inhibitors
23. Mr. Roy, the principal of one reputed school organized a seminar in which he invited parents and principals to discuss the serious issue of diabetes and depression in students. They all resolved this issue by strictly banning the junk food in schools and to introduce healthy snacks and drinks like soup, lassi, milk etc. in school canteens. They also decided to make compulsory half an hour physical activities for the students in

the morning assembly daily. After six months, Mr. Roy conducted health survey in most of the schools and discovered a tremendous improvement in the health of the students.

After reading the above passage, answer the following: 4

- What are the values (at least two) displayed by Mr. Roy?
- As a student, how can you spread awareness about this issue?
- What are tranquilizers? Give an example.
- Why is use of aspartame limited to cold foods and drinks?

24. a) Define 5

- Mole fraction ii) Molality iii) Raoult's law
- Assuming complete dissociation, calculate the expected freezing point of a solution prepared by dissolving 6g of $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ in 0.100kg of water.
(K_f for Water = $1.86 \text{ K kg mol}^{-1}$, Atomic masses: a=23, S=32, O=16, H=1)

OR

- What is Van't Hoff factor? What types of values can it have if in forming the solution, the solute molecules undergo i) Dissociation ii) Association
- How many ml of a 0.1M HCl solution are required to react completely with 1 g of a mixture of Na_2CO_3 and NaHCO_3 containing equimolar amounts of both?
(Molar mass: $\text{Na}_2\text{CO}_3 = 106 \text{ g}$, $\text{NaHCO}_3 = 84 \text{ g}$)

25. a) Write the formula and describe the structure of a noble gas species which is isostructural with i) IBr_2^- ii) BrO_3^- 5

b) Assign reasons for the following:

- SF_6 is kinetically inert.
- NF_3 is an exothermic compound whereas NCl_3 is not.
- HCl is a stronger acid than HF though fluorine is more electronegative than chlorine.

OR

a) How is ammonia prepared on a large scale? Name the process and mention the optimum condition for the production of ammonia by this process.

b) Assign reason for the following:

- H_2S is more acidic than H_2O
- NH_3 is more basic than PH_3
- Sulphur has a greater tendency for catenation than oxygen.

26. a) Write the IUPAC names of the following compounds: 5

i) $\text{CH}_3\text{CO}(\text{CH}_2)_4\text{CH}_3$

ii) $\text{ph}-\text{CH}=\text{CH}-\text{CHO}$

b) Describe the following conversions in not more than two steps:

- Ethanol to 3-Hydroxybutanal
- Benzoic acid to m-Nitro benzyl alcohol
- Propanone to propene

OR

a) Draw the structures of the following compounds:

i) 4-Chloropentan-2-one

ii) p-Nitropropiophenone

b) Give tests to distinguish between the following pairs of compounds

- i) Ethanal and Propanal
- ii) Phenol and Benzoic Acid
- iii) Benzaldehyde and Acetophenone

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