KENDRIYA VIDYALAYA SANGATHAN CHENNAI REGION
COMMON PRE-BOARD EXAMINATION
CLASS: XII   Chemistry

Time allowed: 3 hours]   [Maximum marks: 70

General Instructions:

(i) All questions are compulsory.
(ii) Question nos. **1** to **8** are very short answer questions and carry **1** mark each.
(iii) Question nos. **9** to **18** are short answer questions and carry **2** marks each.
(iv) Question nos. **19** to **27** are also short answer questions and carry **3** marks each.
(v) Question nos. **28** to **30** are long answer questions and carry **5** marks each.
(vi) Use log tables if necessary, use of calculators is not allowed.

1	Which point defect in its crystal units increases the density of a solid?	1
2	What is meant by an elementary reaction?	1
3	Name the two types of adsorption of gases on solids.	1
4	What is the role of collectors in Froth Floation process?	1
5	What is the IUPAC name of: $[Ag(NH_3)_2][Ag(CN)_2]$.	1
6	Draw the structure of 2-Ethoxy -1,1-dimethylcyclohexane.	1
7	Arrange the following compounds in an increasing order of their acid strength: Benzoic acid, 4-Nitrobenzoic acid, 4-Methoxybenzoic acid.	1
8	Write any one difference between amylase and amylopectin?	1
9	Mixing of acetone and chloroform occurs with reduction in volume and is exothermic process. What change will occur in vapour pressure? Explain your answer.	2
10	Define the following: i)Order of a reaction ii)Activation energy of a reaction (or) List two factors on which the rate of a chemical reaction depends.	2
11	For the reaction A----→ B, the rate of reaction becomes twenty seven times when the concentration of A is increased three times. What is the order of the reaction?	2
12	Describe the principle involved in each of the following processes: i)Electro refining ii)Mond's process for refining of Nickel	2
13	What are interstitial compounds? Why are such compounds well known for transition metals?	2
14	Draw a figure to show splitting of degenerate d-orbitals in an octahedral field. How does the magnitude of the Δo decides the high spin and low spin complexes.	2
15	The treatment of alkyl chlorides with aqueous KOH leads to the formation of alcohols but in the presence of alcoholic KOH, alkenes are major products. Explain.	2
16	How the following conversions can be carried out? i) Chloroethane to butane ii)Isopropyl alcohol to Iodoform	2
17	Give reasons: i) Methylamine is a stronger base than ammonia ii)Aniline does not undergo Fridel Crafts reaction.	2
18	Write one chemical reaction each to illustrate the following: i)Gabriel Phthalimidesysthesis ii)Hoffmann-Bromamide reaction	2
19	The density of chromium is 7.2 g cm^{-3}. If the unit cell is a cubic with edge length of 289 pm, determine the type of the unit cell. (Atomic mass of Cr = 52 u) (or) X-ray diffraction studies show that an element crystallises in an fcc unit cell edge of	3

3.608 x 10^{-8} cm. In a separate experiment, the element is determined to have a density of 8.92 g cm^{-3}, calculate the atomic mass of the element.

20 Calculate the boiling point of a solution prepared by adding 15.0 g of NaCl to 250.0 g of water. (K_b for water =0.512 K kg mol^{-1}, Molar mass of NaCl =58.44 g, Assume NaCl undergoes complete dissociation) — 3

21 A colloidal solution of AgI is prepared by two different methods that is — 3
i)By adding $AgNO_3$ to KI solution(excess)
ii)By adding KI to $AgNO_3$solution(excess).
What is the charge acquired by the colloid formed in both the cases. Explain your answer.

22 Draw the structure of i)H_3PO_4ii) $HClO_3$ iii) XeF_4 . — 3

23 Write chemical equations for the reactions involved in the manufacture of potassium dichromate from iron chromite ore. — 3

24 An organic compound A having molecular formula C_6H_6O gives a violet colour with neutral $FeCl_3$ solution. A on treatment with CO_2 and NaOH at 400 K under pressure gives B which on acidification gives a compound C. The compound C reacts with acetyl chloride to give D which is a popular pain killer. Deduce the structure of A, B, C and D. — 3

25 Explain what is meant by — 3
(*i*) a peptide linkage (*ii*) a glycosidic linkage (iii) a nucleotide

26 What are biodegradable polymers? Give two examples. — 3

27 Akash observed that his friend Srihari was showing a change in behaviour from past couple of weeks. Srihari stayed aloof, did not play and mingle with friends and became easily irritable. He avoided going in any functions and parties. Akash shares his concerns with his class teacher. The teacher calledSrihari and advised him to consult a doctor. Doctor prescribes antidepressant drugs for him. After two months Srihari was diagnosed to be normal.
i) Mention the values shown by Akash and Teacher. — 1
ii)Name one antidepressant drugs. — 1
iii)How should Srihari's family help him other than medicines during the course of treatment? — 1

28 i)Calculate the e.m.f of the cell $Mg_{(s)}/ Mg^{2+}(0.1M)\|Cu^{2+}(1.0 X10^{-3}M/Cu_{(s)}$ — 3
Given $E°_{Cu^{2+}/Cu} = +0.34$ V and $E°_{Mg^{2+}/Mg} = -2.37$ V.
ii)What are fuel cells? Write one advantage of fuel cells over other cells. — 2

(or)

i)The resistance of a conductivity cell containing 0.001 M KCl solution at 298 K is 1500Ω. What is the cell constant, if the conductivity of 0.001 M KCl solution at 298 K is 0.146 x 10^{-3} S cm^{-1}? — 2

ii)Explain with one example each the terms weak and strong electolytes. — 2
iii)The standard reduction potential values of three metallic cations X,Y, Z are +0.52, $-3.03, -1.18$ V respectively. What will be the order of reducing power of the corresponding metals? — 1

29 Account for the following: — 5
i)Fluorine does no show variable oxidation states while other members of the halogen family exhibit variable oxidation states.
ii)Iodine is more soluble in KI solution than in water.
iii)Why do boiling points of noble gases increases down the group?
iv)Why ammonia is a good complexing agent?
v)Nitric oxide(NO) is a colourless gas becomes brown when released in air.

(or)

Complete the following chemical reactions:

i) $P_4 + Cl_2$ ------→ ?

ii) $XeF_4 + SbF_5$ ------→ ?

iii) H_3PO_3 -----Heat----→ ?

iv) NaOH   + Cl_2 ------→ ?
 Cold & Dilute

v) $SO_3 + H_2SO_4$ -------------→ ?

30   a) Describe the mechanism of the formation of alcohol from alkene in the presence of   2
dilute acid.

b)Write the chemical equation for the following reactions:
   i)Carbylamine reaction
   ii)Cross aldol condensation
iii)Rosenmund reduction

(or)

a)Give chemical tests to distinguish between compounds in each of the following   2
pairs: i) Benzaldehyde and Acetone
            ii)Phenol and Ethanol

b)Give reasons for the following:
i)Although $-NH_2$ group is an ortho and para directing group, nitration of aniline gives
along with ortho and para as well as meta derivative also, why?
ii)Conc.HI is preferable used in the cleavage of ether linkage. Explain.
iii)Out of PCl_5 and $SOCl_2$ which one is a better reagent for the conversion of alcohol
to alkyl chloride and why?

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