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KENDRIYA VIDYALAYA SANGATHAN, LUCKNOW REGION

FIRST PREBOARD-2019

CLASS- XII

SUBJECT-CHEMISTRY

SET-I

Time : 3 Hrs

Max Marks: 70

General instructions

All questions are compulsory

- 1- Question numbers 1 to 20 are very short answer type questions/objective questions carries one mark each.
- 2- Question numbers 21 to 27 are short answer type questions carries two mark each.
- 3- Question numbers 28 to 34 are long answer type questions – I carries three mark each.
- 4- Question numbers 35 to 37 are long answer type questions – II carries five mark each.
- 5- There is no overall choice. However, an internal choice has been provided in two questions of two marks, two questions of three marks and all the three questions of five marks weight age.
- 6 Use log tables if necessary, use of calculators is not allowed.

SECTION A

Read the passage and answer the questions 1 to 5 that follow

A colloidal solution is a heterogeneous mixture. It is a mixture of dispersed phase and dispersion medium. Colloidal solution exhibit many properties like Brownian movement, Tyndall effect, Electrophoresis, their particles are charged etc. These can be prepared by dispersion method and condensation method. These are classified on the basis of the physical state of dispersion phase and dispersion medium, on the nature of interaction between dispersed phase and dispersion medium, types of particles of dispersed phase. Some examples of colloidal solution are smoke, milk, pumice stone etc.

- | | |
|--|---|
| Q1 Write the dispersed phase and dispersion medium of Smoke. | 1 |
| Q2 What is the type of charge on AgI colloidal sol formed when AgNO ₃ solution is added to KI solution? | 1 |
| Q3 What term is given to the scattering of light by colloidal particles? | 1 |
| Q4 What is the size range of colloidal particles? | 1 |

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2

Q5 Define Brownian movement.

1

Questions 6 to 10 one word questions

Q6 Out of .1 molal solutions of glucose and of potassium chloride, which one will have a higher boiling point?

1

Q7 Can E° cell or ΔrG° for cell reaction ever be equal to zero?

1

Q8 For a reaction $A + B \rightarrow \text{Product}$, the rate law is given by $r = k[A]^{1/2}[B]^2$. What is the order of the reaction?

1

Q9 A reaction is second order with respect to a reactant. How is the rate of the reaction affected if the concentration of the reactant is doubled?

1

Q10 Which of the following ores can be concentrated by froth flotation method?

Fe_2O_3 , ZnS , Al_2O_3

1

Questions 11 to 15 are multiple choice questions:

Q11 In acidic medium, one mole of MnO_4^- ion accepts how many moles of electrons in a redox process:

1

(a) 1 (b) 2 (c) 5 (d) 6

Q12 Which of the following oxidation state is common for all lanthanoids?

1

(a) +2 (b) +3 (c) +4 (d) +5

Q13 When one mole of $CoCl_3 \cdot 5NH_3$ was treated with excess of silver nitrate solution, 2 mol of $AgCl$ was precipitated. The formula of the compound is:

1

(a) $[Co(NH_3)_5Cl_2]Cl$
(b) $[Co(NH_3)_5Cl]Cl_2$
(c) $[Co(NH_3)_4Cl_2](NH_3)Cl$
(d) $[Co(NH_3)_3Cl_3](NH_3)_2$

Q-14 Which is the correct IUPAC name for $CH_3-CH(C_2H_5)-CH_2-Br$:

1

(a) 1-Bromo-2-ethylpropane (c) 1-Bromo-2-ethyl-2-methylethane
(b) 1-Bromo-2-methylbutane (d) 2-Methyl-1-bromobutane

3

Q15 In Williamsons synthesis

1

- (a) an alcohol is heated with conc H_2SO_4 at $140^\circ C$
- (b) an alkyl halide is heated with sodium
- (c) an alkyl halide is heated with sodium alkoxide
- (d) None of the above

Questions 16 to 20 :

(A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.

(B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.

(C) Assertion is correct, but reason is wrong statement.

(D) Assertion is wrong, but reason is correct statement.

Q16. Assertion: Glucose reacts with hydroxylamine to form an oxime and also adds a molecule of hydrogen cyanide to give cyanohydrin. 1

Reason: The carbonyl group is present in the open chain structure of glucose.

Q17 Assertion: Aldehyde and Ketones, both react with Tollen's reagent to form silver mirror. 1

Reason: Both aldehyde and ketones contain carbonyl group

Q18 Assertion: Chloramphenicol is a bacteriostatic antibiotics. 1

Reason: It inhibits the growth of organism.

Q19 Assertion: Aniline becomes less reactive towards electrophilic attack in strongly acidic medium 1

Reason: Acidic medium hinders the generation of electrophile.

Q20 Assertion: The elastomers can be stretched. 1

Reason: The intermolecular forces in these polymers are very strong.

SECTION : B

Q21 State Henrys law .Write its one application .What is the effect of temperature on the solubility of gases in liquid? 2

Q22 Show that in a first order reaction, time required for the completion of 99.9% is 10 times that of half life ($t_{1/2}$) of the reaction . 2

4

Q23 The rate of a reaction quadruples when the temperature changes from 293K to 313K. Calculate the energy of Activation of the reaction assuming that it does not change with temperature . 2

Q24 Although thermodynamically feasible, in practice, magnesium metal is not used for the reduction of alumina in the metallurgy of aluminum. Why? 2

Q25 (i) Draw the structure of XeF₄ and ClF₃. 2

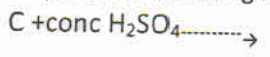
(ii) Complete the following reaction equation



OR

(i) Draw the structure of XeF₂ and SF₄.

(ii) Complete the following reaction equation



Q26 What is biodegradable polymer ? Give an example of a biodegradable polymer. 2

OR

(i) Is $\left(\text{CH}_2 - \underset{\text{C}_6\text{H}_5}{\text{CH}} \right)_n$ a homopolymer or copolymer? Give reason

(ii) Write the monomers of the of Nylon 6,6.

27 (i) Which one of the following is an disinfectant 0.2% solution of phenol or 1% solution of phenol 2

(ii) Give one e.g of artificial sweetner

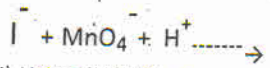
SECTION: C

Q28 Calculate the mass of ascorbic acid (C₆H₈O₆) to be dissolved in 75g of acetic acid to lower its melting point by 1.5°C. K_f = 3.9 Kkg/mol. 3

Q29 (i) Assign the reason : 3

- (a) The enthalpy of atomization of transition elements are high .
- (b) Actinoids show wide range of oxidation states.

(ii) Complete the following reaction equation



Q30 (i) Using IUPAC norms ,write the formulas of : 3

Potassium tetracyanonickelate (II)

(ii) Draw one of the geometrical isomers of the complex [Pt(en)₂Cl₂]²⁺ which is optically inactive.

5

(iii) Write the electronic configuration of Fe(III) on the basis of crystal field theory when it forms an octahedral complex in the presence of strong ligand and weak ligand.

OR

Discuss the nature of bonding, magnetic behavior and number of unpaired electrons in the $[\text{Fe}(\text{CN})_6]^{4-}$ by using VBT.

Q31 (i) Out of SN^1 and SN^2 , which reaction occurs with inversion of configuration 3

(ii) The presence of nitro group at ortho and para positions increases the reactivity of haloarenes toward nucleophilic substitution reaction, give reason.

(iii) How will you convert Aniline to chlorobenzene.

Q32 Write the mechanism of acid catalyzed dehydration of ethanol to ethene. 3

OR

(i) What happens when phenol is treated with zinc dust?

(ii) In Kolbesreaction, instead of phenol, phenoxide ion is treated with carbondioxide. Why?

(iii) O-Nitrophenol has lower boiling point than p-Nitrophenol. Explain?

Q33 Write the reaction with chemical equation- 3

(i) Hoffmansbromamide reaction

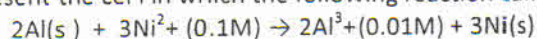
(ii) Coupling reaction

(iii) Why are aliphatic amines stronger bases than aromatic amines?

Q34 Define (i) Glycosidic linkage (ii) Reducing sugars (iii) zwitter ion 3

SECTION: D

Q35 (i) Represent the cell in which the following reaction takes place : 5



Calculate the E_{cell} if E°_{cell} is 1.41V.

(ii) How does molar conductivity vary with increases in concentration for strong electrolyte and weak electrolyte? How can you obtain limiting molar conductivity for weak electrolytes?

OR

Calculate the emf and ΔG for the following reaction at 298 K



Given $E^{\circ}_{\text{Mg}^{2+}/\text{Mg}} = -2.37\text{V}$, $E^{\circ}_{\text{Ag}^{+}/\text{Ag}} = +0.80\text{V}$

6

Q36. Assign a reason for the each of the following:

5

- (a) SCl_6 is not known but SF_6 known
- (b) Noble gases are inert
- (c) H_2S is more acidic than H_2O
- (d) Fluorine does not exhibit any positive oxidation reaction
- (e) ICl is more reactive than I_2

OR

- (i) Give a reaction to show the anomalous behavior of fluorine
- (ii) What happens when XeF_6 reacts with NaF ?
- (iii) Why is H_2S a better reducing agent than H_2O ?
- (iv) Arrange the following acids in increasing order of their acidic character
 $\text{HF}, \text{HCl}, \text{HBr}, \text{HI}$
- (v) Write the formula of a noble gas compound which is isostructural with IBr

Q37 (i) Give reason for the following

5

- (a) Ethanal is more reactive than Acetone towards nucleophilic addition reaction
- (b) $(\text{CH}_3)_3\text{C}-\text{CHO}$ does not undergo aldol condensation
- (ii) Write chemical test with reaction to distinguish-
 - (a) Acetophenone and benzophenone
 - (b) Phenol and ethanoic acid
- (iii) How will you convert Toluene to Benzoic acid?

OR

- (a) An alkene A molecular formula C_5H_{10} on ozonolysis gives a mixture of two compounds B and C. Compound B gives positive Fehlings test and also reacts with iodine and NaOH solution. Compound C does not give positive Fehlings test and also reacts with iodine and NaOH solution. Identify A, B and C & write reaction involved.
- (b) How will you convert?
 - (i) Ethanal to propan-2-ol
 - (ii) Acetic Acid to Methane
