

KENDRIYA VIDYALAYA NAGAON
GUESS PAPER

Class-XII

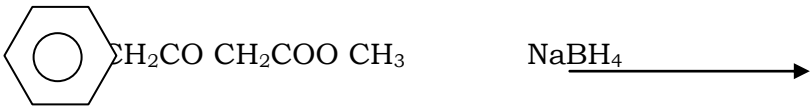
Time : 3 hrs.

Sub-Chemistry

M.M.70

Instructions:-

1. All Questions' are compulsory
2. Question No 1 to 8 are very short answer questions carrying 1 mark each.
3. Question No 9 to 18 are Short answer question's carrying 2 marks each.
4. Question No 19 to 27 are Short answer question's carrying 3 marks each.
5. Question No 28 to 30 are Long answer question's carrying 5 marks each.
6. Use Log table if necessary.

Q 1.	The value of $\Delta_f G^\circ$ for formation of Cr_2O_3 is -540 kJ mol^{-1} and that of Al_2O_3 is -827 kJ mol^{-1} . Is the reduction of Cr_2O_3 possible with Al?	1
Q 2.	When NaBr is heated with conc H_2SO_4 , Br_2 is produced but when NaCl is heated with Conc H_2SO_4 , HCl is produced. Why?	1
Q 3.	Write IUPAC name of: $\text{C}_6\text{H}_5 \text{NHCOCH}_3$	1
Q 4.	What is Kraft temperature?	1
Q 5.	Write IUPAC name of the ionization isomer of: $[\text{Cr}(\text{NH}_3)_5 \text{Br}] \text{SO}_4$	1
Q 6.	Write an example of hydrophobic colloid.	1
Q 7.	What is co-ordination number in hcp and ccp types of solids?	1
Q 8.	Complete: <div style="text-align: center;">  </div>	1
Q 9.	Explain the terms "collectors" and "froth stabilizers" in froth floatation process.	2
Q 10.	(i) How many faraday of charge is required for conversion of Al_2O_3 to Al ? (ii) During electrolysis of NaOH, Cl_2 and H_2 while for molten NaCl only Na metal and Cl_2 gas are obtained. Explain these observations with suitable equation.	2
Q 11.	Explain the following:	2

	(i) Clemenson reduction (ii) Diazotization	
Q12.	(i) Why are transition metal compounds coloured? (ii) Although Sc is the first transition element, its compounds are colourless. Why?	2
Q13.	Which oxide of sulphur is capable of acting as oxidizing as well as reducing agent? Why?	2
Q14.	(i) Draw diagram to illustrate the depression of freezing point when non-volatile solute is dissolved in a volatile solvent. (ii) Two liquids A and B boil at 135 °C and 1850 °C respectively. Which of them has a higher vapour pressure at 800 °C?	2
Q15.	(i) Write mechanism for the cleavage of unsymmetrical ether having a tertiary group with HI. (ii) Why ethyl ter-butyl ether cannot be prepared starting with ethanol?	2
Q16.	How do you distinguish? (i) Phenol & Benzoic acid (ii) Propanol and ethanol	2
Q17.	(i) What is spectrochemical series? (ii) Why are 'ambidentate' ligands? Give example. OR Discuss nature of bonding and magnetic property of the complex $[\text{Fe}(\text{CN})_6]^{3-}$ according to V.B theory. At. Number of Fe = 26	2
Q18.	Give Reasons: (a) Amines are weaker acids than alcohols. (b) Phenol does not undergo acid catalyzed dehydration.	2
Q19.	(a) What are the classes of neurologically active drugs? Write one example for each. (b) What is the use of sodium benzoate in food?	3
Q20.	(i) Why calculations based on colligative properties of solutions sometimes gives abnormal molecular mass values for solute? What is the nature of the abnormalities?	3

	(ii) 2g of C ₆ H ₅ COOH dissolved in 25g of benzene shows a depression in freezing point equal to 1.62 K. Molal depression constant for benzene is 4.9K kg mol ⁻¹ . What is the Percentage (%) of association of acid, if it forms a dimer in solution?	
Q21.	<p>(i) Calculate the emf of the cell in which the following reaction takes place.</p> $\text{Ni (s)} + 2 \text{Ag}^+ (0.002 \text{ M}) \longrightarrow \text{Ni}^{2+} (0.160 \text{ M}) + 2 \text{Ag (s)}$ <p>Given that $E^{\circ}_{\text{Cell}} = 1.05\text{V}$</p> <p>(ii) What are the products obtained at anode and cathode when aqueous CuSO₄ is electrolyzed with Pt electrodes?</p>	3
Q22.	<p>Answer the following:</p> <p>(i) How do you classify carbohydrates on the basis of their hydrolysis?</p> <p>(ii) What are nucleic acids? Mention their two important functions.</p>	3
Q23.	<p>(i) Chromium crystallizes in bcc structure. Its atomic diameter is 245 pm, find its density. Atomic masses of: Cr = 52u , N_A = 6.022 x 10²³mol⁻¹</p> <p>(ii) In the face centered cubic arrangement of A and B atoms where A atoms are at the corner of the unit cell and B atoms at the face centres. One of the A atom is missing from one corner in the unit cell. What is the simplest formula of the compound?</p>	3
Q24.	<p>Account for the following:</p> <p>(i) Chlorobenzene is less reactive towards Nucleophilic substitution.</p> <p>(ii) Ethyl amine has lower boiling point than ethyl alcohol.</p> <p>(iii) pK_a of ethanoic acid is greater than that of chloroethanoic acid.</p>	3
Q25.	<p>(i) Critical temperatures of N₂, CO, CH₄ are 126, 134, and 110 K respectively. Arrange them in increasing order of adsorption on the surface of activated charcoal?</p> <p>(ii) What happens when a freshly precipitated Fe(OH)₃ is shaken with little dil. FeCl₃ solution? Explain with possible reactions.</p>	3
Q26.	<p>(a) What are bio degradable polymers? Give example.</p> <p>(b) Write preparation of: (i) Novolac (ii) Teflon</p>	3
Q27.	(i) Which metal in the 1 st transition series exhibits +1 oxidation state most frequently and	3

why?

(ii) Write down the number of 3d electrons in each of the following ions:

Ti^{2+} , V^{2+} , Cr^{3+} , Mn^{2+} , Fe^{2+} , Co^{3+} , Co^{2+} , Ni^{2+} and Cu^{2+}

Indicate how the five d orbitals are to be occupied for these hydrated ions (Octahedral)

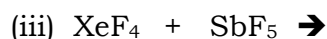
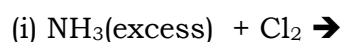
OR

(a) In a given series the difference in the ionization enthalpies between any two successive d block elements is very much less than that in case of s and p block elements. Give the explanation.

(b) Transition elements exhibit highest oxidation states in oxides rather than in fluorides. Why?

(c) A yellow translucent solution is obtained on passing H_2S gas through an acidified solution of $KMnO_4$. Identify the solution and write the balanced chemical equation.

Q28. (a) Complete the following chemical equations and balance them.



(b) Describe the contact process for the manufacture of sulphuric acid. Write the conditions required to maximize the yield of sulphuric acid. Write equations to illustrate following properties of sulphuric acid:

(i) Strong acidic character (ii) Low volatility

(iii) Dehydrating nature (iv) Oxidizing action.

OR

(a) Bleaching of flowers by Cl_2 is permanent, by SO_2 it is temporary. Explain?

(b) When conc. sulphuric acid was added to an unknown salt present in a test tube, a brown gas (A) was evolved. This gas intensified when copper turnings were also added into this tube. On cooling, the gas 'A' changed into a colourless gas 'B'.

5

	<p>(i) Identify the gases A and B.</p> <p>(ii) Write the equations for the reactions involved.</p>	
Q29.	<p>(i) A reaction is 1st order in A and second order in B</p> <p>(a) Write differential rate equation.</p> <p>(b) How is the rate affected when concentration of B is tripled?</p> <p>(c) How is the rate affected when concentration of both A & B is doubled?</p> <p>(ii) The kinetics of the reaction: $A + 2B \Rightarrow \text{Products}$; obeys the rate equation</p> $\text{Rate} = k [A]^1[B]^1$ <p>for it, find:</p> <p>a) Order of the reaction b) Apparent molecularity of reaction</p> <p>c) Order of reaction when B is in large excess.</p> <p style="text-align: center;">OR</p> <p>(a) The rate of reaction,</p> $2\text{NO} + \text{Cl}_2 \longrightarrow 2\text{NOCl},$ <p>is doubled when concentration of Cl_2 is doubled and it becomes eight times when concentration of both NO and Cl_2 are doubled. Deduce the order of the reaction.</p> <p>(b) The time required for 10% completion of a first order reaction at 298 K is equal to that required for its 25% completion at 308K. If the pre-exponential factor for the reaction is $3.56 \times 10^9 \text{ sec}^{-1}$, calculate its rate constant at 318K and also the energy of activation.</p>	5
Q30.	<p>(a) How do you convert the following?</p> <p>(i) Aniline to N-methyl aniline</p> <p>(ii) Benzaldehyde to α-hydroxy phenyl ethanoic acid</p> <p>(iii) 2-bromopropane to 1-bromopropane</p> <p>(b) Arrange the following in the increasing order of property indicated:</p> <p>(a) $\text{CHF}_2 \text{COOH}$, $\text{CHCl}_2 \text{COOH}$, $\text{CH}_3 \text{COOH}$ ----- Acid strength</p> <p>(b) $\text{CH}_3 \text{NH}_2$, $(\text{CH}_3)_2 \text{NH}$, $(\text{CH}_3)_3 \text{N}$, NH_3 ---- Basic strength in aq. solution</p>	5

OR

(i) An unknown aldehyde A, C_7H_6O on reaction with KOH gives B and C. A reacts with Zn-Hg and conc HCl to give D which changes to A by CrO_2Cl_2 . B on heating with soda lime gives E. identify A to E and write all reactions.

(ii) Write equations for:

(a) Cross aldol condensation between benzaldehyde and ethanal in the presence of dil NaOH

(b) Preparation of 2-methyl propan-2-ol from a Grignard reagent.