

**BLUEBELLS SCHOOL INTERNATIONAL
FIRST TERMINAL EXAMINATION**

**CLASS: XII
SUBJECT: CHEMISTRY**

**M.M. 70
TIME: 3hrs**

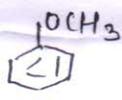
Aug'16

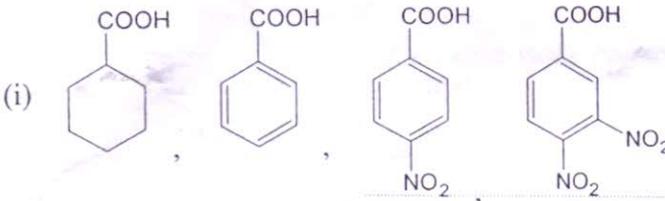
Syllabus : Aldehydes, Ketones and carboxylic acids, Alcohol, Phenol, Ethers, Haloalkanes and Haloarenes, Solids, Solutions, Electrochem, kinetics, surface chem

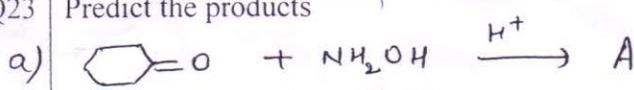
SET B

General Instructions:

- (vi) All questions are compulsory.
- (vii) Question numbers 1 to 8 are very short answers type questions, carrying one mark each.
- (viii) Question numbers 9 to 18 are very short answers type questions, carrying two marks each.
- (ix) Question numbers 19 to 27 are also short answers type questions, carrying three marks each.
- (x) Question numbers 28 to 30 are long answers type questions, carrying five marks each.

Q1	Define osmotic pressure. Is osmotic pressure of a solution a colligative property.	1
Q2	Write one use of the following compounds i) Carbon tetra chloride ii) Iodoform	1
Q3	How much electricity is required in coulomb for the oxidation of 1 mol of dichromate ion to Cr^{+3} .	1
Q4	Give IUPAC names of the following: (a) $CH_3CH_2-O-CH(CH_3)-CH_3$ (b) 	1
Q5	Write the cathode and anode reactions of electrolysis of brine.	1
Q6	Derive the relation between edge length and radius of fcc system	1
Q7	Under what conditions vant hoff factor is more than one?	1
Q8	Give an example of an anisotropic material.	1
Q9	Most of the companies manufacturing ACs and refrigerators now market their product as 100% CFC free and based on green technology. (i) What are CFCs and what are they commonly known as? (ii) Why is there an urgent need to discontinue the use of CFCs ?	2
Q10	Complete the synthesis by giving reagent, starting material or product	2

a)	$(\text{CH}_3)_3 \text{C} - \text{OCH}_3 + \text{HI} \rightarrow$	
b)	$\text{CH}_3 \text{CH} = \text{CH}_2 \xrightarrow[\text{H}_2\text{O}_2/\text{OH}^-]{\text{B}_2\text{H}_6}$	
c)	$\text{CH}_3 \text{COCH}_3 \xrightarrow{?} \text{CH}_3 \text{CH}(\text{OH}) - \text{CH}_3$	
d)	$\text{C}_6\text{H}_5 \text{CH}_2 \text{CH}_3 \xrightarrow{?} \text{C}_6\text{H}_5 \text{COO}^\ominus \text{K}^+$	
Q11	<p>Giving reason, arrange the following in the decreasing order of the property mentioned:</p> <p>(i)  (Acidity)</p> <p>(ii) Pentan-1-ol, n-butane, pentanal, ethoxyethane (boiling point)</p> <p>(iii) benzaldehyde, acetophenone, p-tolualdehyde (nu addi reaction)</p> <p>iv) Primary sec and tert alcohol (acidity)</p>	2
Q12	The cell in which the following reaction occurs $2 \text{Fe}^{3+}(\text{aq}) + 2\text{I}^-(\text{aq}) \rightarrow 2\text{Fe}^{2+}(\text{aq}) + \text{I}_2(\text{S})$ has E^\ominus as 0.236V at 298 K. Calculate the standard gibbs energy and equilibrium constant of the cell reaction.	2
Q13	<p>Give reasons</p> <p>a) It is advised to add ethylene glycol to water in car radiators while driving in a hill station.</p> <p>b) Equimolar solution of glucose and common salt are not isotonic.</p> <p>c) Dehydrated fruits and veges swell on placing in water.</p> <p>d) Scuba divers use air cylinders with air diluted with helium gas.</p>	2
Q14	<p>Explain a test (with reaction) that can be used to discriminate between:</p> <p>a) Aldehyde and ketone b) Aryl and alkyl halide</p>	2
Q15	<p>Name the reagent used in the following reactions;</p> <p>a) Phenol to para nitrophenol</p> <p>b) Anisole to phenol</p> <p>c) Formaldehyde to mixture of methanol and sodium formate</p> <p>d) Tert alcohol to alkene</p>	2
Q16	Calculate the freezing point of a solution containing 0.52 g glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) dissolved in 80.20g water. For water $K_f = 1.86 \text{ K Kg mol}^{-1}$ Also calculate the value of vant' Hoff factor.	2
Q17	What are azeotropes? Give an example of maximum boiling azeotrope.	2

Q18	In Non stoichiometric cuprous oxide, copper to oxygen ratio is less than 2:1. Explain how is this possible? Can you account for the fact that this substance is a p type semiconductor.	2
Q19	Write short notes o a) Wolff Kishner reduction b) Aldol condensation c) Stephen reaction	3
Q20	How would you obtain a) But-2-enal from ethanol b) Butanoic acid from butanol c) Benzoic acid from ethylbenzene	3
Q21	(i) What are isotonic solutions? (ii) Two liquids X and Y have boiling points 110° C and 120° C. Which solution will have lower vapour pressure at a given temperature. (iii) How will the osmotic pressure of a solution be affected if; (b) More of solute is added to it. (b)Temperature of solution is increased	3
Q22	Show that in a first order reaction, time required for completion of 99.9% is 10 times of half-life ($t_{1/2}$) of the reaction. A reaction is first order in A and second order in B. (i) Write the differential rate equation. (ii) How is the rate affected on increasing the concentration of B three times? (iii) How is the rate affected when the concentrations of both A and B are doubled?	3
Q23	Predict the products a)  b) $C_6H_5CHO \xrightarrow{\text{conc NaOH}} B + C$ c) $CH_3 - \underset{\substack{ \\ CH_3}}{C} = O \xrightarrow[\text{KOH / glycol } \Delta]{NH_2NH_2} D$	3
Q24	Explain how rusting of iron is envisaged as setting up of an electrochemical cell.	3
Q25	Rate constant k of a reaction varies with temperature T according to the equation $\log k = \log A - E_a / 2.303R (1/T)$ where E_a is energy of activation. When a graph is plotted for $\log k$ vs $1/T$, a straight line with a slope of -4250 K is obtained. Calculate E_a for the reaction. R IS $8.314 JK^{-1} mol^{-1}$	3

Q26	Give mechanism of esterification reaction.	3
Q27	With the help of a diagram explain the phenomenon used for the desalination of sea water.	3
Q28	<p>a) What are the factors which influence the adsorption of a gas on a solid?</p> <p>b) Why is adsorption always exothermic ?</p> <p>c) What is the difference between multimolecular and macromolecular colloids? Give one example of each.</p> <p>d) Explain what is observed</p> <p>(i) an electrolyte, NaCl is added to hydrated ferric oxide sol. (ii) electric current is passed through a colloidal sol? e) Describe some features of catalysis by zeolites.</p>	5
Q29	<p>(i) A solid AB has CsCl type structure with edge length 4.04 \AA. What is the nearest neighbour distance?</p> <p>(ii) Atoms of element B form hcp lattice and atoms A occupy $\frac{2}{3}$ of octahedral voids. What is the formula of the solid?</p> <p>(iii) Why do alkali metal halides do not show Frenkel defect?</p> <p>(iv) What is band gap?</p>	5
Q30	<p>Give reason</p> <p>a) Acetaldehyde undergoes aldol but formaldehyde does not.</p> <p>b) Dipole moment of chlorobenzene is lower than cyclohexyl chloride.</p> <p>c) $\text{S}_{\text{N}}1$ reactions are accompanied by racemization.</p> <p>d) pK_{a} of fluoroacetic acid is lower than chloroacetic acid.</p> <p>e) Ortho nitro phenol is more volatile than paranitrophenol.</p>	5