BASAVA INTERNATIONAL SCHOOL
TERM I EXAMINATION
SUBJECT: CHEMISTRY (043)

CLASS : XII

DATE: 9-9-25
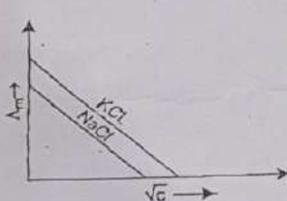
M.M:70

Time: 3Hr.

General Instructions:
(a) There are 33 questions in this question paper with internal choice.
(b) SECTION A consists of 16 multiple -choice questions carrying 1 mark each.
(c) SECTION B consists of 5 short answer questions carrying 2 marks each.
(d) SECTION C consists of 7 short answer questions carrying 3 marks each.
(e) SECTION D consists of 2 case - based questions carrying 4 marks each.
(f) SECTION E consists of 3 long answer questions carrying 5 marks each.
(g) All questions are compulsory.
(h) Use of log tables and calculators is not allowed.

Section-A

The following questions are multiple-choice questions with one correct answer. Each question carries 1 mark. There is no internal choice in this section.

1.	Consider the following graph between molar conductivity (Λ_m) and $\sqrt{c}$: What do you infer about NaCl and KCl from the graph? (a) NaCl and KC are weak electrolytes ✗ (b) Na^+ (aq.)has more conductance than K^+ (aq.) (c) NaCl and KCl are strong electrolytes (d) Na^+ (aq.) has less conductance than K^+ (aq.)due to less hydration		1
2.	Ethanal reacts with hydrazine in the presence of dil H_2SO_4 to give: (a) Ethanal oxime (b) Ethanal semicarbazone (c) Ethanal hydrazone (d) Schiff base	C_2H_5CHO	1
3.	The vitamins which can be stored in our body are: (a) Vitamin A, B, D and E (b) Vitamin A, C, D and K (c) Vitamin A, B, C and D (d) Vitamin A, D, E and K		1
4.	Phenol does not undergo nucleophilic substitution reaction easily due to: (a) acidic nature of phenol (b) partial double bond character of C-OH bond (c) partial double bond character of C-C bond (d) instability of phenoxide ion		1
	Molecules whose mirror image is non superimposable over them are known as chiral. Which of the following molecules is chiral in nature? (i) 2-Bromobutane (ii) 1-Bromobutane (iii) 2-Bromopropane (iv) 2-Bromopropan-2-ol		1
	when nitrobenzene is reduced in Fe/HCl, the product is : (a) $C_6H_5NH_2$ (b) C_6H_5NHOH (c) $C_6H_5NO_2$ (d) $C_6H_5N_2Cl$		1
	The time required for the half-completion $(t_{1/2})$ of a first order reaction is: (a) Dependent on its initial concentration (b) Inversely proportional to its initial concentration (c) Independent of its initial concentration	$t = 0.\frac{693}{k}$	1

(d)   Dependent on square root of its initial concentration

8. In order to prepare a 1° amine from an alkyl halide with simultaneous addition of one CH2 group in the carbon chain, the reagent used as source of nitrogen is _____.
(i) Sodium amide (ii) Sodium azide (iii) Potassium cyanide (iv) Potassium phthalimide

9.

(a)

(b)

(c)

(d)
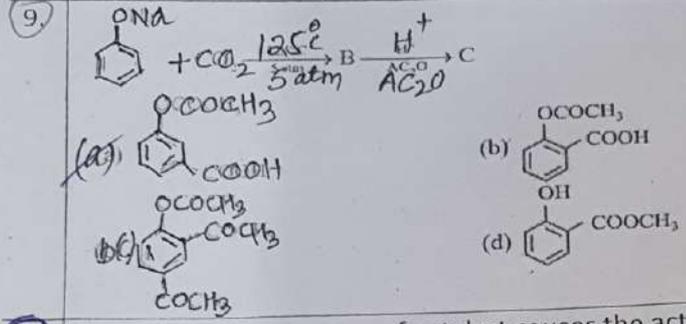
10. At 227°C, the presence of catalyst causes the activation energy of a reaction to decrease by 4.606 KCal, the rate of the reaction will be increased by:
(a) 2 times   (b) 10 times   (c) 100 times   (d) 1000 times

11. Increasing order of rate of HCN addition to compound (I-IV) is
(i) HCHO   (ii) CH_3COCH_3 (iii) $PhCOCH_3$ (iv) PhCOPh
(a) iv < ii < iii < i   (b) iv < iii < ii < I   (c) iii < iv < ii < I   (d) i < ii < iii < iv

12. If K_f value of H_2O is 1.86. The value of ΔT_f for 0.1 m solution of non-volatile solute is
(a) 18.6   (b) 0.186   (c) 1.86   (d) 0.0186

13. Given below are two statements labelled as Assertion (A) and Reason (R)
Assertion (A): Azeotropic mixture are formed by only non-ideal solution
Reason (R): Azeotrope mixture can't be separated by fractional distillation.
Select the most appropriate answer from the options given below:
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

14. Given below are two statements labelled as Assertion (A) and Reason (R)
Assertion : The α-hydrogen atom in carbonyl compounds is less acidic.
Reason : The anion formed after the loss of α-hydrogen atom is resonance stabilised.
Select the most appropriate answer from the options given below:
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

15. Given below are two statements labelled as Assertion (A) and Reason (R)
Assertion : All naturally occurring α-aminoacids except glycine are optically active.
Reason : Most naturally occurring amino acids have L-configuration.
Select the most appropriate answer from the options given below:
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not the correct explanation of A.

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...below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A): Conductivity decreases with dilution.

Reason (R): Number of ions per unit volume decreases on dilution.

Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

| | | 1 |

SECTION B

This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.

17.	The decomposition of hydrocarbon follows the equation $K = (4.5 \times 10^{11}\ s^{-1})e^{-28000k/T}$. Calculate E_a	2
18	An aqueous solution of 2% non-volatile exerts a pressure of 1.004 Bar at the normal boiling point of the solvent. What is the molar mass of the solute ?	2
19.	An organic compound A reacts with PCl_5 to give compound B. Compound B reacts with Na/ether to give n-butane. What are compounds A and B ?	2
20.	Give possible explanation for the following : (i) Cyclohexanone forms cyanohydrins in good yield but 2, 2, 6 trimethylcyclohexanone does not. (ii) There are two – NH2 groups in semicarbazide. However, only one is involved in formation of semi carbazone.	2

OR

Give the chemical test to distinguish between :

(i) Ethanal and Benzaldehyde   (ii) Pentan-2-one and Pentan-3-one

21	How do you explain the presence of an primary alcoholic group in a glucose molecule?	2

SECTION C

This section contains 7 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each.

|		
22	Give equations of the following reactions: (i)Bromine in water with phenol. (ii) Sodiumdichromate in acid with phenol. (iii) Treating phenol wih chloroform in presence of aqueous NaOH	3
23.	A first order reaction takes 69.3 min for 50% completion. Set up on equation for determining the time needed for 80% completion.	3
24.	Write the reactions of D-glucose which can't be explained by its open-chain structure. How can cyclic structure of glucose explain these reactions?	3

OR

Differentiate between the following :

(i) α-helix and β-pleated sheet structure of protein

(ii) Fibrous and globular protein

25	Write chemical reaction to affect the following transformations : (i) Butan-1-ol to Butanoic acid (ii) 3-Nitrobromobenzene to 3-nitrobenzoic acid
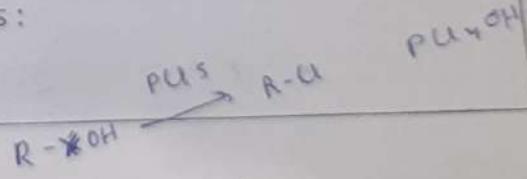
(iii) 4-methylacetophenone to Terephthalic acid

26 | Write the name of the reaction, structure and IUPAC name of the product formed when:
(a) Sodiumtertbutoxide reacts with C_2H_5Br
(b) Propanenitrile reacts with stannous chloride in the presence of hydrochloric acid followed by hydrolysis

27 | Calculate emf of the following cell at 25°C
Sn | Sn²⁺ (0.001M) || H⁺ (0.01N) | H₂(g) (1 bar) | Pt (s)
$E°_{Sn^{2+}/Sn} = -0.14V$, $E°_{H^+/H_2} = 0.00V$

28 | Write the equation, structure and name of products when ethanal reacts with acetone in presence of dilute sodium hydroxide.

SECTION D

The following questions are case-based questions. Carries 4 marks each. Read the passage carefully and answer the questions that follow.

1+1+2

29 | Read the given passage and answer the questions that follow:
Alcohols play a very important role in our daily life. Ordinary spirit used as an antiseptic contains methanol. Ethanol is present in cough syrups, tonics, wine, beer, and whisky, Sugar, starch, cellulose are carbohydrates that also contain a large number —OH groups. Phenol is also an antiseptic in low concentration (0.2%) whereas a 2% solution of phenol is used as a disinfectant. The fragrance of rose is due to citronellol (unsaturated alcohol). Phenol is used for the preparation of many useful compounds like aspirin, methyl salicylate (Iodex), and phenyl salicylate (salol) used as an intestinal antiseptic.
(a) How is phenol prepared from cumene? What is the advantage of this method?
(b) Convert phenol to picric acid.
(c) Distinguish between phenol and benzyl alcohol? Why does phenol turn pink after long-standing?

1+1+1+1

30 | Read the passage given below and answer the following questions:
All chemical reactions involve interaction of atoms and molecules. A large number of atoms/molecules are present in a few gram of any chemical compound varying with their atomic/molecular masses. To handle such large number conveniently, the mole concept was introduced. All electrochemical cell reactions are also based on mole concept. For example, a 4.0 molar aqueous solution of NaCl is prepared and 500 mL of this solution is electrolysed. This leads to the evolution of chlorine gas at one of the electrode. The amount of products formed can be calculated by using mole concept.

(i) The total number of moles of chlorine gas evolved is
(a) 0.5 (b) 1.0 (c) 1.5 (d) 1.9
(ii) If cathode is a Hg electrode, then the maximum weight of amalgam formed from this solution:
(a) 300g (b) 446 g (c) 396 g (d) 256 g
(iii) In the electrolytes, the number of moles of electrons involved are
(a) 2 (b) 1 (c) 3 (d) 4
(iv) In electrolysis of aqueous NaCl solution when Pt electrode is taken, then which gas is liberated at cathode?
(a) H₂ gas (b) Cl₂ gas (c) O₂ gas (d) None of these
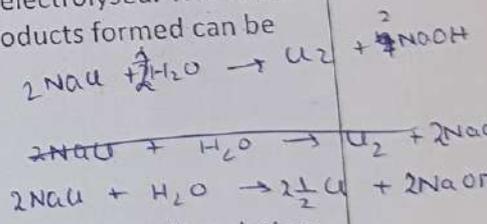
llowing questions are long answer type and carry 5 marks each.

ter shells of two eggs are removed. One of the egg is placed in pure water and the other is | 2+3

d in saturated solution of NaCl. What will be observed and why ?

A solution prepared by dissolving 8.95 mg of a gene fragment in 35.0 ml of water has an

notic pressure of 0.335 ton at 25°C. Assuming the gene fragment is a non-electrolyse,

termine the molar mass.

low would you bring about the following conversions : | 5

(i) Propene to 2-bromopropane   (ii) Bromoethane to propanoic acid

(iii) 1-chloropropane to 1-propanol   (iv) Ethanol to chloroethane

(v) 1-iodopropane to propene

(a) A compound 'A' having molecular formula C_3H_7ON reacts with Br_2 in presence of NaOH to give | 2+3
compound 'B'. This compound 'B' reacts with HNO_2 to form alcohol and N_2 gas. Identify compound
'A' and 'B' and write the reaction involved.

(b) Give one chemical test to distinguish between the following pairs of compounds :

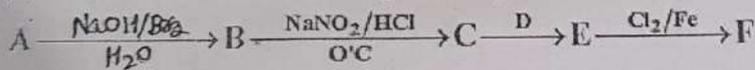(a) Ethylamine and N-Ethylethanamine (b) Aniline and benzylamine (c) Aniline and N-
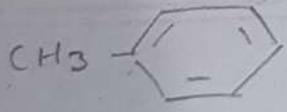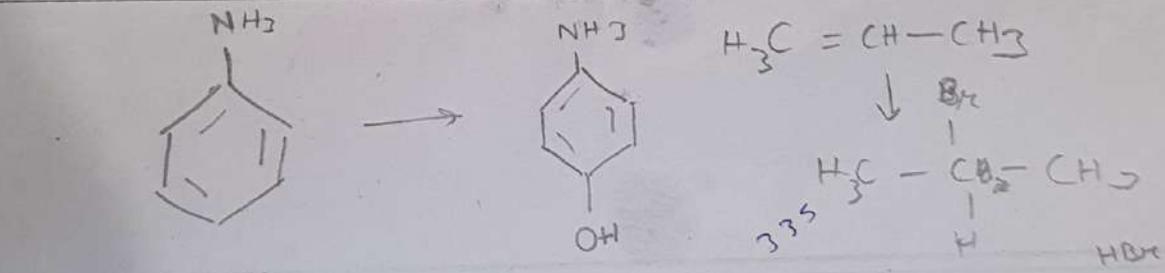methylaniline

OR

(i) Write the chemical reaction stating the reaction conditions required for each of the following

conversions :

(a) Aniline to p-Hydroxyazobenzene (b) Acetaldehyde to ethylamine

(ii) Write the structure of reagents/organic compounds 'A' to 'F' :

$$A \xrightarrow[H_2O]{NaOH/Br_2} B \xrightarrow[O'C]{NaNO_2/HCl} C \xrightarrow{D} E \xrightarrow{Cl_2/Fe} F$$

D is KCN/Cu