26.06.25

Delhi Public School, Howrah

PERIODIC TEST - I (2025-2026)

CLASS - XII

SUBJECT - CHEMISTRY (Code No. 043)

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

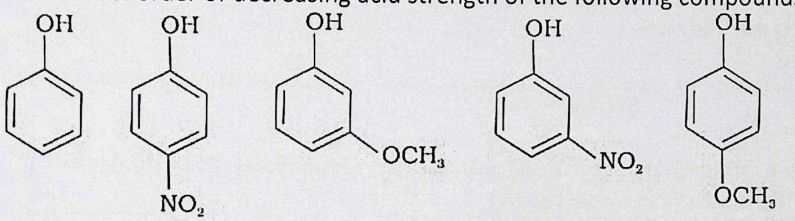
TIME - 3 HOURS **F.M. - 70**

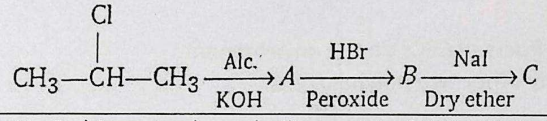
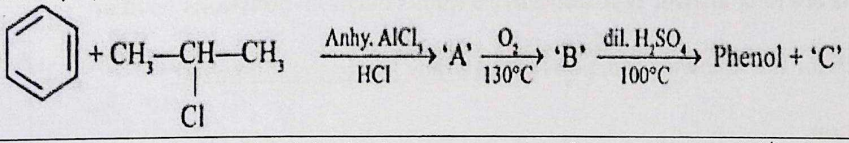
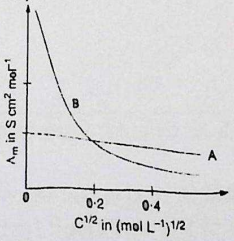
General Instructions:

Read the following instructions carefully.

(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 very 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.**	MARKS
1.	Which of the following terms does not describe CH_2=CH-CH_2-OH? (A) Primary (B) Monohydric (C) Allylic (D) Vinylic	1
2.	An unknown alcohol is treated with "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol reacts fastest? (A) Tertiary alcohol (B) Secondary alcohol (C) Primary alcohol (D) Both secondary and primary alcohol	1
3.	When a non-volatile solid is added to pure water, it will (A) boil above 100°C and freeze above 0°C (B) boil below 100°C and freeze above 0°C (C) boil above 100°C and freeze below 0°C (D) boil below 100°C and freeze below 0°C	1
4.	The quantity of charge required to obtain one mole of aluminium from Al_2O_3 is _____. (A) 1F (B) 6F (C) 3F (D) 2F	1
5.	In electrolysis of aqueous NaCl solution, when Pt electrode is taken, then which gas is liberated at the cathode? (A) H_2 gas (B) Cl_2 gas (C) O_2 gas (D) Na vapours	1

6.	Value of Henry's constant K_H _____. (A) Increases with an increase in temperature. (B) Decreases with an increase in temperature. (C) Remains constant. (D) First increases, then decreases.	1
7.	Which of the following aqueous solutions should have the highest boiling point? (A) 1.0 M NaOH (B) 1.0 M Na_2SO_4 (C) 1.0 M NH_4NO_3 (D) 1.0 M KNO_3	1
8.	Which of the following compounds results from the dehydrogenation of secondary alcohols? (A) Ketone (B) Aldehyde (C) Carboxylic acid (D) Amine	1
9.	What is the product formed when alkyl halides are heated with dry Ag_2O? (A) Benzene (B) Ketone (C) Ester (D) Ether	1
10.	The correct order of decreasing acid strength of the following compounds is  (a) (b) (c) (d) (e) (A) e > d > b > a > c (B) b > d > a > c > e (C) d > e > c > b > a (D) e > d > c > b > a	1
11.	Molecules whose mirror images are non-superimposable over them are known as chiral. Which of the following molecules is chiral in nature? (A) 1 – bromo – 3 – methyl butane (B) 2 – bromobutane (C) 3 – Bromo pentane (D) 2 – bromo propan – 2 – ol.	1
12.	If M, N, O, P and Q are in the increasing order of their standard potentials in standard conditions of their standard half cells, then by combination of which two half cells will maximum cell potential be obtained? (A) M and N (B) M and O (C) M and P (D) M and Q	1
	Given below are two statements labelled as Assertion (A) and Reason (R). **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.**	
13.	**Assertion (A):** Ether behaves as a base in the presence of mineral acids. **Reason (R):** Due to the presence of lone pairs of electrons on oxygen, ether accepts protons.	1

14.	**Assertion (A):** Osmosis does not take place in two isotonic solutions separated by a semi-permeable membrane. **Reason (R):** Isotonic solutions have the same osmotic pressure.	1
15.	**Assertion (A):** An electrochemical cell can be set up only if the redox reaction is spontaneous. **Reason (R):** A reaction is spontaneous if the free energy change is negative.	1
16.	**Assertion (A):** Boiling points of alkyl halides decrease in the order : RI > RBr > RCl > RF **Reason (R):** Attractions get stronger as the molecules get bigger in size.	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.	Depict the cell equation of a galvanic cell in which the following reaction takes place. $Zn(s) + 2Ag^+(aq) \rightarrow Zn^{2+}(aq) + 2Ag(s)$	2
18.	Although chlorine is an electron withdrawing group, yet it is ortho- and para- directing in electrophilic aromatic substitution reaction. Give reason.	2
19.	While performing Chemistry practical, it is directed that the bottle of liquid ammonia is to be cooled before opening the seal, but Ritam forgot to do so before opening. What consequence did he face?	2
20.	(A) Give an example of a fuel cell and write the cathode and anode reaction for it. **OR** (B) Write the significance of salt bridge in an electrochemical series.	2
21.	When an aromatic organic compound with molecular formula C_6H_6O is treated with bromine water, a white precipitate of compound Y is obtained. Give the structure and the name of X and Y, write the chemical reaction involved.	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.	Write the structural formula of A, B, C in the following sequence of reactions. 	3
23.	A solution of sucrose ($C_{12}H_{22}O_{11}$) in water has a boiling point of 373.128 K. Calculate the freezing point of the same solution. (Given, for water, $K_f = 1.86$ K kg mol^{-1} and $K_b = 0.52$ K kg mol^{-1})	3
24.	Identify A, B,C. 	3
25.	In the plot of molar conductivity (Λ_m) vs square root of concentration ($C^{1/2}$), following curves are obtained for two electrolytes, A and B.  Predict the nature of electrolytes A and B, stating suitable reason.	3
26.	(A) Give an example of a solid solution in which the solute is a liquid. (B) X and Y liquids on mixing produce cold solution. What type of deviation is shown by them? (C) Give an example of a substance that can be used as an SPM.	3
27.	Write a short note on: (A) Reimer Tiemann Reaction (B) Kolbe reaction	3

28.	(A) Why is thionyl chloride preferred over phosphorus pentachloride for the conversion of alkyl halide from alcohol? Explain with the necessary reaction. **OR** (B) 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.	3
	SECTION: D **The following questions are case-based questions. Each question has an internal choice and carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follow.**	
29.	Aarav Sharma is very fond of a special drink made by his grandmother using different fruits available in their hometown. It has an outstanding taste and also provides great health benefits of natural fruits. He thought of utilizing his grandmother's recipe to create a new product in the beverage market that provides health benefits and also contains the fizziness of various soft drinks available in the market. Based on your understanding of the "Solutions" chapter, help Aarav Sharma to accomplish his idea by answering the following: (A) How can he add fizz to the special drink made by his grandmother? (B) What is the law that can help Aarav to make his drink fizzy? (C) What precautions should he take while bottling so that his product does not lose fizz during storage and handling across long distances? **OR** (C) Why is it recommended to serve the drink in cold conditions?	4
30.	Chlorofluorocarbons (CFCs) described as 'miracle chemicals,' have no natural resources. They were first manufactured in the 1930s and industries soon found a variety of applications for them due to their chemical non-reactivity and heat absorbing properties. CFCs have been used as refrigerants in air conditioners and refrigerators, in aerosol spray cans, in manufacturing foams and as cleansing agents in the manufacture of electronics. These chemicals have been given the trade name 'Freons' and the term has since become a household name. (A) What is 'Freon – 12'? (B) State any two harmful effects of CFCs on the environment. (C) Write one use each of any other two polyhalogens. **OR** (C) State a method to prepare a Freon with relevant equations.	4
	SECTION: E **The following questions are long answer type and carry 5 marks each. All questions have an internal choice.**	
31.	Write one example each for the following reactions <u>(Answer any five of the following):</u> (A) Markwonikoff addition. (B) Saytzeff elimination. (C) Finkelstein reaction. (D) Sandmayer's reaction. (E) Friedel-Crafts reaction. (F) Wurtz-Fittig reaction.	5
32.	i. (A) If α is the degree of dissociation of Na_2SO_4, calculate the Van't Hoff factor to determine the molecular mass. (B) Why are aquatic species more comfortable in cold water in comparison to warm water? (C) Write the significance of different values of the van't Hoff factor? **OR** ii. (A) Assume three samples of juices A, B and C have glucose as the only sugar present in them. The concentrations of samples A, B and C are 0.1M, 0.5M and 0.2 M respectively. Which one will have the highest freezing point? (B) How does sprinkling salt help in clearing the snow-covered roads in hilly areas? (C) Write the unit of K_f.	5

33.	i. (A) State Faraday's law. (B) What is S.H.E.? (C) Write any two differences between conductance & conductivity. **OR** ii. (A) If the molar conductivities at infinite dilution for NaI, CH_3COONa and $(CH_3COO)_2Mg$ are 12.69, 9.10 and 18.78 S cm^2 mol^{-1} ,respectively, at 25°C, then calculate the molar conductivity of MgI_2 at infinite dilution. (B) Write the statement of the law used to calculate the above numerical problem. (C) What do you mean by "infinite dilution?"	5