D.A.V. PUBLIC SCHOOL

SAMPLE PAPER FOR UNIT TEST

2025-2026

Std:-XII

Sub:- Chemistry **Time:-2 Hours**
Date :- **Max. Marks:-50**

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General Instructions:
Read the following instructions carefully

a) There are **23** questions in this question paper with internal choice.
b) Section A consists of 10 multiple choice questions carrying 1 mark each.
c) Section B consists of 4 very short answer questions carrying 2 marks each.
d) Section C consists of 6 short answer questions carrying 3 marks each.
e) Section D consists of 1 case-based question carrying 4 marks.
f) Section E consists of 2 long answer questions carrying 5 marks each.
g) **All questions are compulsory.**
h) **Use of log tables and calculators is not permitted**.

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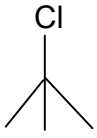
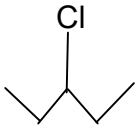
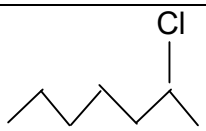
SECTION – A

	The following questions are multiple-choice questions with one correct answer. Each question carries one mark. There is no internal choice in this section.
1.	Which of the following alkyl halide will undergo S_N1 reaction most readily? (a) $(CH_3)_3C$-I(b) $(CH_3)_3C$-Cl (c) $(CH_3)_3C$-Br(d) $(CH_3)_3C$-F
2.	In the Arrhenius equation, when log K is plotted against 1/T, a straight line is obtained whose: (a) slope is A/R and intercept is Ea. (b) slope is A and intercept is -Ea/R. (c) slope is -Ea/RT and intercept is log A. (d) slope is -Ea/2.303R and intercept is log A.
3.	In a reaction, the initial concentration of the reactants increases four fold and the rate becomes 16 times of its initial value. The order of the reaction is (a) 2.0(b) 3.5(c) 1.5 (d) 2.5
4.	If 50% of a reaction occurs in 100 seconds and 75% of the reaction occurs in 200 seconds, the order of this reaction is (a) 1(b) 2(c) zero(d) 3
5.	The positive value of the standard electrode potential of Cu^{+2}/Cu indicates that (a) this redox couple is a stronger reduction agent than the H^+/H_2couple (b) this redox couple is a stronger oxidizing agent than H^+/H_2 (c) Cu can displace H_2 from acid (d) Cu cannot displace H_2 from acid
6.	Which of the following solutions will have the highest conductivity at 298 K? (a) 0.01 M HCl solution(b) 0.1 M HCl solution (c) 0.01 M CH_3COOH solution(d) 0.1 M CH_3COOH solution
7.	What effect does temperature have on the half-life of a first-order reaction? (a) It increases(b) It decreases (c) It remains the same(d) Both increases as well as decrease

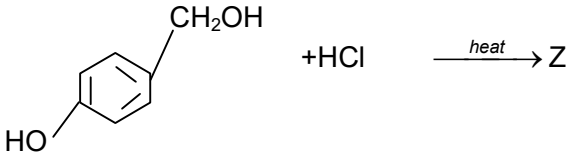
8.	A voltaic cell is made by connecting two half-cells represented by half equations below. $Sn^{2+}(aq) + 2\,e^- \longrightarrow Sn\,(s);\ E^0 = -0.14$ V $Fe^{3+}(aq) + e^- \longrightarrow Fe^{2+}(aq);\ E^0 = +0.77$ V Which statement is correct about this voltaic cell? (a) Fe^{2+} is oxidized and the voltage of the cell is -0.91 V (b) Sn is oxidized and the voltage of the cell is 0.91 V (c) Fe^{2+} is oxidized and the voltage of the cell is 0.91 V (d) Sn is oxidized and the voltage of the cell is 0.63 V
9.	Given below are two statements labelled as Assertion (A) and Reason (R). **Assertion (A):**KCN reacts with methyl chloride to give methyl isocyanide **Reason (R):** CN^- is an ambident nucleophile. Select the most appropriate answer from the options given below: 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. Assertion is wrong, but reason is correct statement.
10.	Given below are two statements labelled as Assertion (A) and Reason (R). **Assertion (A):**For a zero order reaction the unit of rate constant and rate of reaction are same. **Reason (R):** Rate of reaction for zero order reaction is independent of concentration of reactant. Select the most appropriate answer from the options given below: 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.
	SECTION – B
	This section contains 4 questions. The following questions are very short answer type and carry 2 marks each.
11.	A first order reaction takes 10 minutes for 25% decomposition. Calculate $t_{1/2}$ for the reaction. (Given: log 2 = 0.3010, log 3 = 0.4771, log 4 = 0.6021).
12.	The molar conductivity of a 1.5 M solution of an electrolyte is found to be 138.9 Scm^2mol^{-1}. Calculate the conductivity of this solution.
13.	(a) Which alkyl halide from the following pair is chiral and undergoes faster S_N2 reaction? (i)  and 

	(ii)  and 
14.	Name the alkene which will yield 1-chloro-1-methylcyclohexane by its reaction with HCl. Write the reactions involved.
	SECTION – C
	This section contains 6 questions. The following questions are short answer type and carry 3 marks each.
15.	A first order reaction has a rate constant 1 X 10^{-3} per sec. How long will 5g of this reactant take to reduce to 3g? (log 3 = 0.4771; log 5 = 0.6990)
16.	(a) Why should Grignard reagent be prepared under anhydrous conditions? (b) Alkyl halides give alcohol with aqueous KOH whereas in the presence of alcoholic KOH, alkenes are formed. Why? (c) Alkenes decolourise bromine water in presence of CCl_4 due to formation of (i) allyl bromide (ii) vinyl Bromide (iii) bromoform (iv) vicinal Dibromide
17.	The following initial rate data were obtained for the reaction: $2NO(g) + Br_2(g) \longrightarrow 2NOBr(g)$

Expt. No.	[NO] $molL^{-1}$	[Br_2] $molL^{-1}$	Initial rate M/S
1	0.05	0.05	1.0 X 10^{-3}
2	0.05	0.15	3.0 X 10^{-3}
3	0.15	0.05	9.0 X 10^{-3}

(a) What is the order with respect to NO and Br_2 in the reaction?
(b) Calculate the rate constant (k).
(c) Determine the rate of reaction when concentration of NO and Br_2 are 0.4 M and 0.2 M, respectively.

18.	When a certain conductivity cell was filled with 0.05 M KCl solution it has a resistance of 100 ohm at 25^0C. When the same cell was filled with 0.02M $AgNO_3$ solution the resistance was 90 ohm. Calculate the conductivity and molar conductivity of $AgNO_3$ solution. (Given: Conductivity of 0.05M KCl solution = 1.35 X 10^{-2} $ohm^{-1}cm^{-1}$)
19.	(a) What is the effect of change in concentration on conductivity and molar conductivity of the solution? (b)Write Nernst equation and calculate the emf of the following cell. $Sn(s) / Sn^{2+}(0.04M) // H^+(0.02M) / H_2(g) / pt(s)$ (1bar) (Given $E^{\ominus}Sn^{2+} / Sn = -0.14V$, log 1.25=0.0969)
20.	a) Define rate constant (k). b) Write the unit of rate constant for the following: (i) First order reaction (ii) Second order reaction
	SECTION – D The following question is case-based question. The question carries 4 (1+1+2) marks. Read the passage carefully and answer the questions that follow.
21.	Batteries and fuel cells are very useful forms of galvanic cell. Any battery or cell that we use as a source of electrical energy is basically a galvanic cell however for

	a battery to be of practical use it should be reasonably light compact and its voltage should not vary appreciably during its use. There are mainly two types of batteries primary batteries and secondary batteries. In the primary batteries, the reaction occurs only once and after use over a period of time the battery becomes dead and cannot be reused again, whereas the secondary batteries are rechargeable. Answer the following questions: (a) The cell potential of mercury cell is 1.35V, and remains constant during its life. Give reason. (b) Write two advantages of fuel cells over other galvanic cells. (c) Write the reactions involved in the recharging of the lead storage battery. OR (c) Write the reactions involved in Dry Cell.
	SECTION – E The following questions are long answer type and carry 5 marks each.
22.	(a)Illustrate the following name reactions: i. Finkelstein reaction ii. Sandmeyer reaction (b) Convert Ethanol to propanenitrile. (c) Complete the following reactions. (i) $CH_3CH = CH_2 + HBr \xrightarrow{Peroxide} X + NaI \xrightarrow{acetone} Y$ (ii) 
23.	(a) Value of standard electrode potential for the oxidation of Cl^- ion is more positive than that of water, even then in the electrolysis of aq. NaCl, why is Cl^- oxidized at anode instead of water? (b) Calculate the number of coulombs required for the oxidation of 1 mole of water to oxygen. (c) Which type of a metal can be used in cathodic protection of iron against rusting? (d) In the button cell, widely used in watches and other device, the following reaction takes place: $Zn_{(s)} + Ag_2O(s) + H_2O(l) \rightarrow Zn^{2+}(aq) + 2Ag_{(s)} + 20H^-_{(aq)}$ Determine E^o cell and ΔrG^o for the reaction. $E^{\ominus}Ag^+/Ag = +0.80V$ $E^{\ominus}Zn^{2+}/Zn = -0.76V$

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