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FIRST UNIT TEST PRACTICE PAPER

Sub: - Chemistry

STD: - XII

Time: - 2 hours

Date: -

Max. Marks: - 50

General Instructions:

- 1) All questions are compulsory.
- 2) Question numbers 1 to 3 are very short answer questions and carry 1 mark each.
- 3) Question numbers 4 to 7 are short answer questions and carry 2 marks each,
- 4) Question numbers 8 to 15 are also short answer questions and carry 3 marks each.
- 5) Question numbers 16 to 18 are long answer questions and carry 5 marks each.
- 6) Use log tables if necessary.

1. Define Polymerisation. (1M)
2. Derive an expression to calculate the time required for completion of zero order reaction. (1M)
3. What is Lucas Reagent? (1M)
4. Give example of Pseudo First order Reaction. (1M)
5. (i) Is $(\text{NH-CHR-CO})_n$, a homopolymer or copolymer?
(ii) Write the structures of the monomers of Dacron. (2M)
6. (i) Why are the numbers 6, 6 and 6 put in the names of nylon- 6, 6 and nylon-6? (2M)
(ii) How does vulcanization change the properties of natural rubber?

7. (i) Illustrate graphically the effect of catalyst on activation energy. (2M)

(ii) The decomposition of dimethyl ether leads to the formation of CH_4 , H_2 and CO and the reaction rate is given by

$$\text{Rate} = k [\text{CH}_3\text{OCH}_3]^{3/2}$$

The rate of reaction is followed by increase in pressure in a closed vessel, so the rate can also be expressed in terms of the partial pressure of dimethyl ether, i.e.

$$\text{Rate} = k (P_{\text{CH}_3\text{OCH}_3})^{3/2}$$

If the pressure is measured in bar and time in minutes, then what are the units of rate and rate constants?

8. Write the names and draw the structures of the monomers of the following polymers:

- (i) Bakelite
- (ii) Teflon
- (iii) Nylon2-nylon6

(3M)

9. (i) Which of the following is a fibre? (3M)

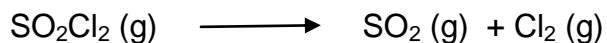
Nylon, Neoprene, PVC

(ii) Name a polymer used in laminated sheets and give the name of monomer units involved in its formation.

10. For the reaction: $2\text{A} + \text{B} + \text{C} \rightarrow \text{A}_2\text{B} + \text{C}$, the rate = $k[\text{A}][\text{B}]^2$ with $k = 2.0 \times 10^{-6} \text{ M}^{-2}\text{S}^{-1}$ calculate the initial rate of the reaction when $[\text{A}] = 0.1\text{M}$, $[\text{B}] = 0.2\text{M}$ and $[\text{C}] = 0.8\text{M}$. If the rate of reverse reaction is negligible then calculate the rate of reaction after $[\text{A}]$ is reduced to 0.06M .

(3M)

11. The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at a constant volume:



Experiment	Time (s)	Total pressure (atm)

(3M)

1	0	0.4
2	100	0.7

Calculate the rate constant.

(Given: $\log 4 = 0.6021$, $\log 2 = 0.3010$)

12. Give reasons for the following:

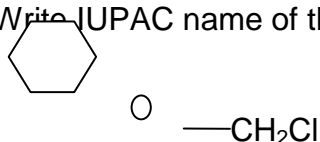
(i) Ethyl iodide undergoes S_N2 reaction faster than ethyl bromide.

(ii)(-) 2- Butanol is optically inactive.

(iii) C-X bond length in halobenzene is smaller than C-X bond length in CH_3-X .

(3M)

13. (a) Write IUPAC name of the following compound



(b) How will you convert the following:

(i) Toluene to Benzyl alcohol

(ii) Ethanol to ethylfluoride

(3M)

14. Primary alkyl halide (A) C_4H_9Br reacted with alcoholic KOH to give compound (B). Compound (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) was reacted with sodium metal it gave a compound (D) C_8H_{18} that was different than the compound when n-butyl bromide was reacted with sodium. Give the structural formula of A, B, C & D and write the equations for all the reactions.

(3M)

15. A child of seven years got fever. He refused to take medicine. His mother crushed the Crocin tablet and mixed it with honey and gave it to the child saying its sweet and better.

After reading the above passage, answer the following questions:

(i) Define rate of reaction and give its SI units.

(ii) Which out of the two, uncrushed pill or crushed pill have higher rate of absorption and why?

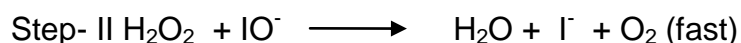
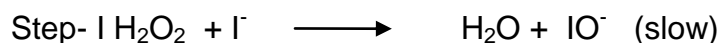
(iii) Which values were kept in mind in this activity?

(4M)

16. (a) Define 'order of a reaction'.
 (b) What is the effect of temperature on the rate constant of a reaction? How can this temperature effect on the rate constant be represented quantitatively?
 (c) Consider the decomposition of hydrogen peroxide in alkaline medium which is catalysed by iodide ions.



This reaction takes place in two steps as given below



- (i) Write the rate law expression and determine the order of reaction w.r.t. H_2O_2 .
 (ii) What is the molecularity of each individual step? (5M)
17. (a) Given the standard electrode potentials

$$\text{K}^+/\text{K} = -2.93\text{V}, \text{Ag}^+/\text{Ag} = 0.80\text{V}$$

$$\text{Hg}^{2+}/\text{Hg} = 0.79\text{V}, \text{Mg}^{2+}/\text{Mg} = -2.37\text{V}, \text{Cr}^{3+}/\text{Cr} = -0.74\text{V}$$

Arrange these metals in their increasing order of reducing power.

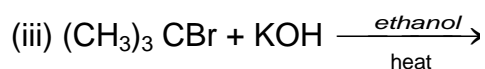
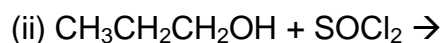
- (b) What is the sign of ΔG for electrolytic cell?
 (c) A galvanic cell is constructed with Ag^+/Ag and $\text{Fe}^{3+}/\text{Fe}^{2+}$ electrodes. Find the concentration of Ag^+ at which the emf of the cell is zero at equimolar concentrations of Fe^{2+} and Fe^{3+} ions.
 ($E^0 \text{Ag}^+/\text{Ag} = 0.80\text{V}$; $E^0 \text{Fe}^{3+}/\text{Fe}^{2+} = 0.77\text{V}$) (5M)

18. (a) Illustrate the following name reactions:

(i) Sadmeyer's reaction

(ii) Wurtz Fittig reaction

(b) Complete the following reactions.



(5M)