

1. Attempt all questions.
2. All questions carry equal marks.
3. Draw neat labeled diagrams wherever necessary.
4. Use of log tables and non-programmable calculator is allowed.
5. For Q.2, Q.3 and Q.4 attempt A and B OR C and D.

1.1 Do as directed (Any fifteen)

Define the following terms

Reversible process.

Isobaric process.

Chemical kinetics.

Pseudo order reaction.

Oxidising agent.

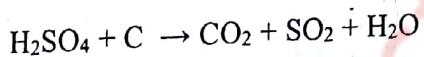
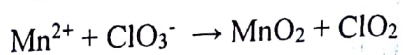
Fill in the blanks

An \_\_\_\_\_ process is a change of a system, in which the temperature remains constant.

Unit of rate of the reaction is \_\_\_\_\_.

For a first order reaction, if  $t_{1/2}$  is 10min then K will be \_\_\_\_\_  $\text{min}^{-1}$ .

Balance the equation



State True or False

In a spontaneous reaction, free energy change is positive.

In thermodynamics, 'Q' represents the internal energy of the system.

Order of a chemical reaction can be zero.

Reduction is a gain of electrons.

An oxidant undergoes oxidation.

Give one word for the following

A system that does not exchange matter or energy with the surrounding.

Reactions in which all the reactants are in the same phase.

A constant which is equal to the rate of the reaction when concentration of reactant is unity.

A molecule that donates electrons.

A charged molecule due to presence of extra electron.

- Q. 2 A Explain the first law of thermodynamics and state its limitations.  
 Q. 2 B What are the different types of systems? Give one example of each.

OR

- Q. 2 C What is entropy? List its characteristics and give its sign convention.  
 Q. 2 D Explain the mechanical efficiency of the Carnot's cycle.

- Q. 3 A Derive the integrated rate equation for a second order reaction with equal concentration of reactants.  
 Q. 3 B Define and explain first order reaction with the help of an example.

OR

- Q. 3 C Discuss any one method for determining the rate of the reaction.  
 Q. 3 D Define specific reaction rate. If a first order reaction is 25% complete in 30 minutes. Calculate the specific reaction rate.

- Q. 4 A Differentiate between oxidizing and reducing agents giving suitable examples.  
 Q. 4 B What is a substitution reaction? Explain giving suitable examples.

OR

- Q. 4 C What is an oxidation number? Explain the rules to assign oxidation number.  
 Q. 4 D Explain the steps of balancing redox reactions using ion electron method, with

- Q. 5 Write Short notes on any three of the following

- Types of boundaries.
- Isochoric processes.
- Molecularity of the reaction.
- Factors affecting a chemical reaction.
- Elimination reactions.