Total No. of Printed Pages: 2

**SUBJECT CODE NO: - YY-2373**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**B.Sc. (CBCGS) (Pattern 2022) F.Y SEM II**

**Examination April / May - 2024**

**Chemistry Paper-IV Physical Chemistry**

**[Time: 1:30 Hours]** **[Max. Marks: 40]**

Please check whether you have got the right question paper.

N. B
1) All questions are compulsory.
2) All questions carry equal marks.



**Q.1** Explain in detail Carnot cycle. **10**

**OR**

Explain in brief
a] Give the applications of Hess's low. **5**
b] Explain effect of Change of pressure on equilibrium state of reaction. **5**

**Q.2** Deduce Graham's law of diffusion and Avogadro's hypothesis from kinetic gas equation. **10**

**OR**

a] Derive equation for rate constant for zero order reaction **5**
b] In a first order reaction, after 40 seconds, 2.5 moles of the reactant was found to be converted to product. Calculate rate constant of the reaction. **5**
(Given - Initial concentration of the reactant = 4 moles)

**Q.3 Write short Notes on (Any Two)** **10**
a) Intensive and Extensive properties
b) P-v isotherms of real gases.
c) Characteristics of Second order reaction.
d) Entropy and Enthalpy.

**Q.4 Multiple choice questions:-** **10**

1) According to law of mass action, the rate of reaction is directly proportional to
a) Volume of the container
b) Equilibrium constant
c) Nature of reactants
d) Molar concentration of reactants

2) The first law of thermodynamic is also known as
a) Law of mass action
b) Law of Conservation of mass
c) Law of conservation of energy
d) Law of conservation of mass and energy

3) A well stoppered thermos flask contains some ice cubes. This is an example of
   a) Isolated system
   b) Closed system
   c) Open system
   d) Heterogeneous system

4) The beat engine which demonstrates a maximum convertibility of heat into work is known as
   a) Hess's cycle
   b) Carnot's cycle
   c) Claudius cycle
   d) Gibb's cycle

5) Rate of reaction
   a) Decrease with increase in temperature
   b) Increase with increase in temperature
   c) May increase or decrease
   d) Does not depend on temperature

6) The rate constant of zero-order reactions has the unit
   a) $S^{-1}$
   b) $Lmol^{-1} S^{-1}$
   c) $L^2 mol^{-2} S^{-1}$
   d) $mol\ L^{-1} S^{-1}$

7) According to Charles's Law
   a) $P \propto T$
   b) $C \propto T$
   c) $V \propto T$
   d) $T \propto V$

8) The state in which rate of forward and backward reaction is equal, is termed as
   a) Dissociation state
   b) Equilibrium state
   c) Spontaneous state
   d) None of the above

9) In pseudo unimolecular reactions,
   a) Both reactants are present in low concentration
   b) Both reactants are present in the same concentration
   c) One reactant is non-reactive
   d) One reactant is present in excess

10) At constant temperature, the product pressure and volume of a given amount of a gas is constant, this is _____
   a) Boyle's law
   b) Gay-Lussac law
   c) Charles's Law
   d) None of these