

- Q.29 Explain the significance of Vander walls equation.
- Q.30 What are elementary and non-elementary reactions explain in brief.
- Q.31 Differentiate between reversible and irreversible reactions.
- Q.32 Define reactors and explain basic types of reactors in brief.
- Q.33 Explain constructional detail of mixed flow reactor with neat diagram.
- Q.34 Discuss the concept of equilibrium and free energy in brief.
- Q.35 Explain concept of internal energy and chemical equilibrium in brief.

SECTION-D

Note : Long Answer type question. Attempt any two questions. (2x10=20)

- Q.36 Derive an expression of rate constant for second order reaction.
- Q.37 Derive the relation of work done for an ideal gas undergoing adiabatic process.
- Q.38 With neat and labeled diagram explain all the steps involved in carnot cycle and its efficiency.

b)

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Chemical Engg./(Pulp & Paper)
Subject : Chemical Engg. Thermodynamics & Reaction Engg.

Time : 3 Hrs.

M.M. : 100

SECTION-A

Note : Multiple choice questions. All questions are compulsory. (10x1=10)

- Q.1 _____ law of thermodynamics is used to understand concept of energy conservation.
- a) Third b) Second
 - c) Zeroth d) First
- Q.2 System which can neither exchange matter nor energy with the surroundings is called _____.
- a) Open b) closed
 - c) Isolated d) None of these
- Q.3 Which of the following is intensive property.
- a) Temperature b) Molarity
 - c) Density d) All of these
- Q.4 Which of the following is not a state function
- a) Internal energy b) Enthalpy
 - c) Volume d) Work
- Q.5 A process in which no heat change takes place is remains _____
- a) An adiabatic process

- b) An Isothermal process
c) An Isochoric process
d) An Isobaric process
- Q.6 Order of reaction can be
a) Zero b) Fraction
c) Whole number d) All of these
- Q.7 The rate of reaction tell us about
a) The reactants taking part in the reaction
b) The products taking part in the reaction
c) How slow or fast the reaction is taking place
d) None of them
- Q.8 PFR Stands for
a) Plug flow reaction b) Plug free reaction
c) Plug flow reactor d) Plug for reactor
- Q.9 Second law of thermodynamics introduce the concept of
a) Entropy b) Enthalpy
c) Free Energy d) Internal energy
- Q.10 If all reactants and products are in gaseous state, the reaction is _____
a) Homogenous b) Heterogeneous
c) Multiple d) None of these

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define surroundings.

- Q.12 State Roult's law.
Q.13 Define Isobaric process.
Q.14 Write SI unit of work.
Q.15 Define Reactor.
Q.16 State any one factor affecting reaction rate.
Q.17 Define path functions.
Q.18 Give any two examples of extensive properties.
Q.19 Write expression for half-life period for a second order reaction.
Q.20 Give any one example of heterogeneous reaction.

SECTION-C

- Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)
- Q.21 Differentiate between homogenous and heterogeneous reaction.
Q.22 Explain types of systems with the help of examples.
Q.23 Drive expression for ideal gas equation.
Q.24 Write mathematical expression of enthalpy, entropy and free energy.
Q.25 Define First law of thermodynamics and states its limitation.
Q.26 Explain the effect of temperature on equilibrium constant.
Q.27 Define and explain the concept of activation energy in chemical reactions.
Q.28 State and explain Amagat's law and Henery's law.