Q.27 Derive an expression to calculate the time required for completion of a zero order reaction.

Q.28 Name the various forms of energy.

Q.29 Differentiate open and closed system.

Q.30 Write a note on first order reaction.

Q.31 Write a note on work for ideal gas undergoing polytropic process.

Q.32 Differentiate between adiabatic and isothermal process.

Q.33 Define single and multiple reaction.

Q.34 Define equilibrium constant.

Q.35 What is the entropy change for reversible and irreversible process?

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 50% of a first order reaction is complete in 25 minutes. Calculate the time required to complete 90% of the reaction.

Q.37 Define and explain the significance of first, second and zeroth law of thermodynamics.

Q.38 Explain performance of thermal systems used in industry.

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4th Sem / Chemical Engg. (P&P)
Subject:- Chemical Engineering thermodynamics and reaction Engg.

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 First law of thermodynamics is based on law of conservation of_____.

a) Energy b) Mass
c) Momentum d) None

Q.2 Free energy change at equilibrium is_____

a) Positive b) Indeterminate
c) Negative d) Zero

Q.3 Chemical reaction rate is a _____ property.

a) Chemical b) Physical
c) Intensive d) Extensive

Q.4 Measurement of thermodynamic property of temperature is facilitated by _____ law of thermodynamics

a) Third b) Second
c) First d) Zeroth

Q.5 In the following reaction the rate of reaction is a function of rate constant alone is_____order reaction.

a) Zero b) First
c) Third d) Second

Q.6 Free energy change at equilibrium is_____
a) Positive b) Indeterminate
c) Negative d) Zero

Q.7 Melting of ice is example of _____process.
a) Adiabatic b) Isothermal
c) Isometric d) None

Q.8 _____is the most suitable reactor of the pharmaceutical industry.
a) PBR b) MFR
c) PFR d) Batch reactor

Q.9 The rate constant of a first order reaction depends on _____?
a) Time b) Concentration
c) Temperature d) Pressure

Q.10 In_____thermodynamic process, heat is not exchanged with the surroundings.
a) Isothermal b) Adiabatic
c) Isobaric d) Isotropic

SECTION-B

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

Q.11 The equilibrium constant of chemical reaction_____ in the presence of catalyst.

Q.12 State first law of thermodynamic for closed system.

Q.13 Mention one effect of pressure on equilibrium constant.

Q.14 What is heterogeneous system?

Q.15 Write one application of dalton's law.

Q.16 What do you understand by heat of ideal gas undergoing reversible process?

Q.17 The rate constant of a reaction is $k=3.28x10^{-4}S^{-1}$. What is the order of reaction?

Q.18 State one variable affecting zero order reaction.

Q.19 What is carnot cycle?

Q.20 What is the general statement for second law of thermodynamics

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define activation energy of a reaction.

Q.22 Name the process involved in homogenous and heterogeneous systems.

Q.23 Explain in detail the first law of themodynamics for open system with example.

Q.24 Explain the working of plug flow reactor.

Q.25 What is ideal gas law?

Q.26 5 moles of an ideal gas expand reversible to ten times its original volume at 27°C. Calculate the charge in entropy.