

Program: BE Biotechnology Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester V

Course Code: BTC503 and Course Name: Thermodynamics and Biochemical Engineering

Time: 1 hour

Max. Marks: 50

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Q.1	If a closed system is undergoing an irreversible process, the entropy of the system
Option A:	must increase
Option B:	always remains constant
Option C:	must decrease
Option D:	can increase, decrease or remain constant
Q.2	A mixture of ideal gases is an ideal solution
Option A:	Never
Option B:	Only at low pressure
Option C:	Only at low pressure & temperature well above critical point
Option D:	Always
Q.3	In an ideal gas mixture, the fugacity of a component in the mixture is equal to
Option A:	mole fraction
Option B:	total pressure
Option C:	partial pressure
Option D:	chemical potential
Q.4	A phase is defined as a
Option A:	completely homogeneous and uniform state of matter.
Option B:	state of matter, which may not be homogeneous but consists of a single component.
Option C:	multicomponent state of matter, which may be homogenous or heterogeneous
Option D:	none of these.
Q.5	At constant temperature and pressure, for a pure substance, the ratio of specific Gibbs free energy to the chemical potential is equal to
Option A:	0
Option B:	1
Option C:	∞
Option D:	<0
Q.6	Compressibility factor (Z) of an ideal gas is.....at all temperature and

	pressure .
Option A:	1
Option B:	>1
Option C:	<1
Option D:	0
Q.7	The triple point of most fluids is close to
Option A:	boiling point
Option B:	melting point
Option C:	critical point
Option D:	none of these
Q.8	For an ideal gas, the enthalpy
Option A:	increases with rise in pressure.
Option B:	decreases with rise in pressure.
Option C:	is independent of pressure.
Option D:	is a path function.
Q.9	At the critical point, the latent heat of vaporisation is
Option A:	Zero
Option B:	Unity
Option C:	Infinity
Option D:	Unpredictable
Q.10	All gases near their critical temperature occupy volume 'n' times that of ideal gas. The value of 'n' is
Option A:	0.5
Option B:	1
Option C:	>1
Option D:	<1
Q.11	Change of state namely evaporation, condensation, freezing and melting is an..... process.
Option A:	Isothermal
Option B:	Adiabatic
Option C:	Isobaric
Option D:	Isochoric
Q.12	The total change in the enthalpy of a system is independent of the
Option A:	number of intermediate chemical reactions involved.
Option B:	pressure and temperature.
Option C:	state of combination and aggregation in the beginning and at the end of the reaction.
Option D:	none of these.
Q.13	The internal energy of an ideal gas does not change in a reversible

process.
Option A:	Isothermal
Option B:	Adiabatic
Option C:	Isobaric
Option D:	isometric
Q.14	A system is said to be at equilibrium, if the entropy of the system has reached.....value.
Option A:	Minimum
Option B:	Zero
Option C:	Maximum
Option D:	None
Q.15	Pick out the wrong statement:
Option A:	The expansion of a gas in vacuum is an irreversible process.
Option B:	An isometric process is a constant pressure process.
Option C:	Entropy change for a reversible adiabatic process is zero.
Option D:	Free energy change for a spontaneous process is negative.
Q.16 explains the equilibrium constant for any chemical reaction.
Option A:	Henry's law
Option B:	Law of mass action
Option C:	Hess's law
Option D:	none of these
Q.17	No work is done by the system, when a reaction occurs at constant
Option A:	Volume
Option B:	Temperature
Option C:	Pressure
Option D:	none of these
Q.18	The melting point of paraffin wax (which contracts on solidification).....with pressure rise.
Option A:	Increases
Option B:	Decreases
Option C:	remains unchanged
Option D:	decreases linearly
Q.19	Internal energy change of a system over one complete cycle in a cyclic process is
Option A:	Zero
Option B:	+ ve
Option C:	- ve
Option D:	dependent on the path
Q.20	The work done in an adiabatic change in a particular gas depends upon

	changes in the.....only.
Option A:	Temperature
Option B:	specific heat
Option C:	Volume
Option D:	Pressure
Q.21	Which of the following behaves most closely like an ideal gas ?
Option A:	He
Option B:	N ₂
Option C:	O ₂
Option D:	H ₂
Q.22law of thermodynamics ascertains the direction of a particular spontaneous process.
Option A:	Zeroth
Option B:	First
Option C:	Second
Option D:	Third
Q.23	At.....point, all the three phases (i.e. solid, liquid and gas) coexist.
Option A:	Eutectic
Option B:	Triple
Option C:	Plait
Option D:	critical
Q.24	What happens in a reversible adiabatic expansion process ?
Option A:	Heating takes place.
Option B:	Cooling takes place.
Option C:	Pressure is constant
Option D:	Temperature is constant
Q.25	A system in which there is exchange of energy but not of mass, is called a/an.....system.
Option A:	isolated
Option B:	Open
Option C:	Insulated
Option D:	Closed