

Total No. of Printed Pages: 2

SUBJECT CODE NO: -B-2088
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. Pattern - 2013 (S.Y SEM III)
Examination November / December 2025
Chemistry Paper-VIII (Physical Chemistry)

[Time: 1:30 Hours]**[Max. Marks: 50]**

Please check whether you have got the right question paper.

N. B

- 1) Attempt all questions.
- 2) Illustrate your answer with suitable diagram.



Q1

a) Define isothermal process, adiabatic process, isobaric process, isochoric process and cyclic process with example. 10

b) Give the various statements of second law of thermodynamics. 10

OR

c) Define extensive properties and intensive properties with example. One mole of an ideal gas at 300K is allowed to expand reversibly at constant temperature from a volume of 15 litres to 30 litres. calculate the work done by the gas ($R=8.314 \text{ JK}^{-1} \text{ mol}^{-1}$) 10

d) Define the term entropy. Give physical significance of entropy. 10

Q2

a) State and explain Le-Chatelier's principle. 10

b) What is Gibb's free energy? Explain how it serves as criteria for Spontaneity 10

OR

Write short notes on any four of the following. 20

1. Internal energy and enthalpy.
2. First law of thermodynamics.
3. Carnot theorem.
4. Helmholtz work function.
5. Clapeyron equation.
6. Law of mass action.

Q3 Multiple choice questions.**10**

1) The system which is not uniform throughout is.....

- | | |
|-------------------------|------------------------|
| a) heterogeneous system | b) closed system. |
| c) isolated system | d) homogeneous system. |

2. The system which can exchange only energy but not matter with the surrounding is -----
a) open system b) closed system
c) isolated system d) homogeneous system.
3. The properties of system which depend upon the quantity of matter present in the system -----
a) isochoric properties b) isobaric properties
c) extensive properties d) intensive properties
4. The change in enthalpy during a chemical reaction is independent of the path between the initial and final state is.....
a) Le-Chatelier's law b) Boyle's law
c) Kirchhoff's law d) Hess's law
5. When water is cooled to ice, its entropy...
a) decreases b) increases
c) remains same d) becomes zero
6. Efficiency of heat engine operating between 400K and 200k is....
a) 0.25 b) 0.50 c) 0.75 d) 1.00
7. It is impossible to transfer for a self-acting machine, unaided by any external agency to convert heat continuously, from one body at lower temperature to a body at a higher temperature is the statement of ----- law of thermodynamics
a) first b) modified first c) second d) third
8. The process is spontaneous, if the change in free energy ΔG is -----
a) one b) greater than zero
c) zero d) less than zero
9. Equilibrium of a chemical reaction is characterized by -----
a) rate of forward reaction is greater than rate of backward reaction
b) rates of forward and backward reaction are equal.
c) rate of forward reaction is less than rate of backward reaction
d) rates of forward and backward reaction are zero
10. The equation $\frac{dp}{dT} = \frac{\Delta H}{T(V_2 - V_1)}$ is called -----
a) Gibbs equation b) Kirchhoff's equation
c) clapeyron equation d) Helmholtz's equation

