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SUBJECT CODE NO:- B-2150
FACULTY OF SCIENCE
B.Sc. S.Y (Sem-III) Examination March/April 2018
Chemistry Paper-VIII
Physical Chemistry

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

Please check whether you have got the right question paper.

N.B (i) Attempt all questions.
(ii) Illustrate your answer with suitable labeled diagram.

Q.1 a) Give various statements of first law of thermodynamics. 10
Calculate the maximum work done when 2 moles of oxygen gas expands reversibly and isothermally from 20 atm to 1 atm at 300K (R=1.987 cal)

b) What is Helmholtz work function? 10
Give its variation with temperature and pressure.

OR

c) Define molar heat capacity at constant pressure and volume. Derive relationship between them. 10

d) State and explain Carnot's theorem. Calculate efficiency and amount of heat supplied to Carnot cycle working between 305 K and 415 K. If maximum work obtained is 700 Joule. 10

Q.2 a) Derive Clausius-clapeyron equation. Give its applications. 10
b) Explain the concept of entropy. Give its physical significance. 10

OR

Write short notes on (any four)

a) Extensive and Intensive properties 05
b) Hess's law of constant heat summation 05
c) Statements of second law of thermodynamics. 05
d) Gibb's free energy 05
e) Reaction isotherm. 05
f) Le Chatelier's principle. 05

Q.3 Multiple Choice questions. 10

1. Which of the following is not extensive property?
(a) Volume
(b) mass
(c) Entropy
(d) Density

2. An adiabatic process takes place at constant …….
   (a) Pressure
   (b) Volume
   (c) Temperature
   (d) Heat

3. For an isothermal process ΔE =……
   (a) Zero
   (b) One
   (c) >1
   (d) <1

4. …… law states that the amount of heat absorbed or evolved in a chemical process is the same whether the process takes place in one or several steps.
   (a) Boyle's law
   (b) Hess's law
   (c) Kirchhoff's law
   (d) Hook's law

5. The energy of the universe is constant but entropy is continuously……..
   (a) Decreases
   (b) Increases
   (c) Zero
   (d) None of these

6. The efficiency of heat engine is always
   (a) Greater than one
   (b) Less than one
   (c) Zero
   (d) Equal to one

7. The Gibb's free energy function (G) can be defined as
   (a) G=H + TS
   (b) G=H-TS
   (c) G=TS-H
   (d) G=TS+H

8. A process which proceeds on its own accord, with any outside assistance is called…….
   (a) Spontaneous process
   (b) Non-spontaneous process
   (c) Reversible process
   (d) Irreversible process

9. The rate of chemical reaction is proportional to the product of the active masses of the reactants is
   (a) Le Chatelier's principle
   (b) Law of mass action
   (c) Avogadro's law
   (d) Hess's law

10. The clausius – Clayperon equation helps to calculate
   (a) Latent heat of vaporization
   (b) Work done
   (c) Efficiency of engine
   (d) All of these.