

DEPARTMENT OF CHEMISTRY

Name of the Associate Professor: Mrs. Manju Singh

Class and Section: B.Sc. III (Sec-A, Day 5 & 6): B.Sc. II (Sec-A, Day 3 & 4) (Sec-B, Day 1 & 2)

Chemistry Lesson Plan: 17 weeks (January 2018 to April 2018)

Week 1, Day 1, 1-Jan-18
<ul style="list-style-type: none">○ Second law of thermodynamics, need for the law, different statements of the law, Carnot's cycles and its efficiency, Carnot's theorem Thermodynamics scale of temperature
Week 1, Day 2, 2-Jan-18
<ul style="list-style-type: none">○ Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T.
Week 1, Day 3, 5-Jan-18
<ul style="list-style-type: none">○ Second law of thermodynamics, need for the law, different statements of the law, Carnot's cycles and its efficiency, Carnot's theorem. Thermodynamics scale of temperature
Week 1, Day 4, 6-Jan-18
<ul style="list-style-type: none">○ Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T.
Week 1, Day 5, 5-Jan-18
<ul style="list-style-type: none">○ Holiday Guru Govind Singh Birthday
Week 1, Day 6, 6-Jan-18
<ul style="list-style-type: none">○ Introduction to statistical mechanics and its significance.
Week 1, Day 7, 7-Jan-18
<ul style="list-style-type: none">○ Sunday
Week 2, Day 1, 8-Jan-18
<ul style="list-style-type: none">○ statement of concept of residual entropy
Week 2, Day 2, 9-Jan-18
<ul style="list-style-type: none">○ Evaluation of absolute entropy from heat capacity data. Gibbs function (ΔG) and Helmholtz function (ΔA) as thermodynamic quantities.
Week 2, Day 3, 10-Jan-18
<ul style="list-style-type: none">○ Statement of concept of residual entropy.
Week 2, Day 4, 11-Jan-18
<ul style="list-style-type: none">○ Evaluation of absolute entropy from heat capacity data. Gibbs function (ΔG) and Helmholtz function (ΔA) as thermodynamic quantities.
Week 2, Day 5, 12-Jan-18
<ul style="list-style-type: none">○ Need for statistical thermodynamics, comparison with classical and quantum mechanics.
Week 2, Day 6, 13-Jan-18
<ul style="list-style-type: none">○ Thermodynamic probability.
Week 2, Day 7, 14-Jan-18
<ul style="list-style-type: none">○ Sunday
Week 3, Day 1, 15-Jan-18
<ul style="list-style-type: none">○ Gibbs Free energy (ΔG) as criteria for thermodynamic equilibrium and spontaneity.

Week 3, Day2, 16-Jan-18	○ Advantage of ΔG over entropy change. Variation of ΔG with ΔP , ΔV and ΔT .
Week 3, Day 3, 17-Jan-18	○ ΔG as criteria for thermodynamic equilibrium and spontaneity
Week 3, Day 4, 18-Jan-18	○ Advantage of ΔG over entropy change. Variation of ΔG with ΔP , ΔV and ΔT .
Week 3, Day 5, 19-Jan-18	○ Maxwell Boltzmann distribution statistics
Week 3, Day 6, 20-Jan-18	○ Born- Oppenheimer approximation
Week 3, Day 7, 21-Jan-18	○ Sunday
Week 4, Day 1, 22-Jan-18	○ Vasant Panchami
Week 4, Day 2, 23-Jan-18	○ Entropy change in physical change, entropy as a criterion of spontaneity and equilibrium
Week 4, Day 3, 24-Jan-18	○ Sir Chhotu Ram Jayanti
Week 4, Day 4, 25-Jan-18	○ Entropy change in physical change, entropy as a criterion of spontaneity and equilibrium.
Week 4, Day 5, 26-Jan-18	○ Republic Day
Week 4, Day 6, 27-Jan-18	○ Partition function and its physical significance. Factorization of partition function.
Week 4, Day 7, 28-Jan-18	○ Sunday
Week 5, Day 1, 29-Jan-18	○ Third law of thermodynamics & Nernst heat theorem.
Week 5, Day 2, 30-Jan-18	○ Entropy change in physical change, entropy as a criteria of spontaneity and equilibrium
Week 5, Day 3, 31-Jan-18	○ Third law of thermodynamics: Nernst heat theorem
Week 5, Day 4, 1-Feb-18	○ Entropy change in physical change, entropy as a criteria of spontaneity and equilibrium
Week 5, Day 5, 2-Feb-18	○ Test chapter :1
Week 5, Day 6, 3-Feb-18	○ Interaction of radiation with matter.
Week 5, Day 7, 4 Feb-18	○ Sunday
Week 6, Day 1, 5-Feb-18	○ Thermodynamics - Numericals
Week 6, Day2, 6-Feb-18	○ Test

Week 6, Day 3, 7-Feb-18
○ Thermodynamics - Numericals
Week 6, Day 4, 8-Feb-18
○ Test
Week 6, Day 5, 9-Feb-18
○ Differences between thermal and photochemical processes.
Week 6, Day 6, 10-Feb-18
○ Maharshi Dayanand Saraswati Jayanti
Week 6, Day 7, 11-Feb-18
○ Sunday
Week 7, Day 1, 12-Feb-18
○ Electrolytic and Galvanic cells , reversible & irreversible cells.
Week 7, Day2, 13-Feb-18
○ Maha Shivratri
Week 7, Day 3, 14-Feb-18
○ Electrolytic and Galvanic cells
Week 7, Day 4, 15-Feb-18
○ Reversible & irreversible cells
Week 7, Day 5, 16-Feb-18
○ Laws of photochemistry: Grotthus-Drapper law, Stark Einstein law (law of photochemical equivalence).
Week 7, Day 6, 17-Feb-18
○ Jablonski diagram depicting various processes occurring in the excited state
Week 7, Day 7, 18-Feb-18
○ Sunday
Week 8, Day 1, 19-Feb-18
○ Assignment-1, Conventional representation of Electrochemical cells.
Week 8, Day2, 20-Feb-18
○ Calculation of thermodynamic quantities of cell reaction (ΔG , ΔH & ΔK).
Week 8, Day 3, 21-Feb-18
○ Assignment-1, Conventional representation of Electrochemical cells.
Week 8, Day 4, 22-Feb-18
○ Calculation of thermodynamic quantities of cell reaction (ΔG , ΔH & ΔK).
Week 8, Day 5, 23-Feb-18
○ Qualitative description of Fluorescence, Phosphorescence, non-radiative processes (internal conversion, intersystem crossing).
Week 8, Day 6, 24-Feb-18
○ Quantum yield, Photosensitized reactions-energy transfer processes (simple examples). Assignment-1
Week 8, Day 7, 25-Feb-18
○ Sunday
Week 9, Day 1, 26-Feb-18
○ Types of reversible electrodes.
Week 9, Day2, 27-Feb-18
○ Conventional representation of Electrochemical cells.
Week 9, Day 3, 28-Feb-18-4-Mar-18
○ University Holiday's
Week 10, Day 1, 5-Mar-18

○ Metal- metal ion, gas electrode, metal –insoluble salt- anion and redox electrodes
Week 10, Day2, 6-Mar-18
○ Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential.
Week 10, Day 3, 7-Mar-18
○ Types of reversible electrodes ,metal- metal ion, gas electrode, metal –insoluble salt- anion and redox electrodes ,Assignment :1
Week 10, Day 4, 8-Mar-18
○ Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential.
Week 10, Day 5, 9-Mar-18
○ Test chapter: 2
Week 10, Day 6, 10-Mar-18
○ Dilute Solutions and Colligative Properties.
Week 10, Day 7, 11-Mar-18
○ Sunday
Week 11, Day 1, 12-Mar-18
○ Standard Hydrogen electrode, reference electrodes, standard electrode potential, sign conventions.
Week 11, Day2, 13-Mar-18
○ Concentration cells with and without transference.
Week 11, Day 3, 14-Mar-18
○ Standard Hydrogen electrode, reference electrodes, standard electrode potential, sign conventions.
Week 11, Day 4, 15-Mar-18
○ Concentration cells with and without transference.
Week 11, Day 5, 16-Mar-18
○ Ideal and non-ideal solutions, methods of expressing concentrations of solutions.
Week 11, Day 6, 17-Mar-18
○ Raoult's law. Colligative properties: (i) relative lowering of vapor pressure Raoult's law. ii) Elevation in boiling point
Week 11, Day 7, 18-Mar-18
○ Sunday
Week 12, Day 1, 19-Mar-18
○ liquid junction potential and its measurement
Week 12, Day2, 20-Mar-18
○ Assignment -2
Week 12, Day 3, 21-Mar-18
○ liquid junction potential and its measurement
Week 12, Day 4, 22-Mar-18
○ Assignment-2
Week 12, Day 5, 23-Mar-18
○ Sahidi Diwas
Week 12, Day 6, 24-Mar-18
○ Colligative prop. Cont.-(iii) depression in freezing point, (iv) osmotic pressure. ○ Thermodynamic derivation of relation between amount of solute and elevation in boiling point.
Week 12, Day 7, 25-Mar-18

○ Sunday
Week 13, Day 1, 26-Mar-18
○ Test
Week 13, Day2, 27-Mar-18
○ Numerical
Week 13, Day 3, 28-Mar-18
○ Test
Week 13, Day 4, 29-Mar-18
○ Mahavir Jyanti
Week 13, Day 5, 30-Mar-18
○ Thermodynamic derivation of depression in freezing point. ○ Applications in calculating molar masses of normal, dissociated and associated solutes in solution.
Week 13, Day 6, 31-Mar-18
○ Statement and meaning of the terms – phase, component and degree of freedom, thermodynamic derivation of Gibbs phase rule. Assignment :2
Week 13, Day 7, 1-April-18
○ Sunday
Week 14, Day 1, 2-April-18
○ Applications of EMF measurement in solubility product
Week 14, Day2, 3-April-18
○ Potentiometric titrations using glass electrode
Week 14, Day 3, 4-April-18
○ Applications of EMF measurement in solubility product
Week 14, Day 4, 5-April-18
○ Potentiometric titrations using glass electrode
Week 14, Day 5, 6-April-18
○ Phase equilibria of one component system –Example – water system.
Week 14, Day 6, 7-April-18
○ Gibbs Phase rule in detail with example.
Week 14, Day 7, 8-April-18
○ Sunday
Week 15, Day 1, 9-April-18
○ Numerical problems
Week 15, Day2, 10-April-18
○ Numerical problems
Week 15, Day 3, 11-April-18
○ Numerical problems
Week 15, Day 4, 12-April-18
○ Numerical problems
Week 15, Day 5, 13-April-18
○ Phase equilibria of two component systems solid-liquid equilibria.
Week 15, Day 6, 14-April-18
○ Ambedkar Jyanti
Week 15, Day 7, 15-April-18
○ Sunday
Week 16, Day 1, 16-April-18
○ Revision and preparation of Exams.

Week 16, Day2, 17-April-18
○ Revision and preparation of Exams.
Week 16, Day 3, 18-April-18
○ Parshuram Jyanti
Week 16, Day 4, 19-April-18
○ Revision and preparation of Exams
Week 16, Day 5, 20-April-18
○ simple Eutectic systems and Examples.
Week 16, Day 6, 21-April-18
○ Pb-Ag system, desilverisation of lead.
Week 16, Day 7, 22-April-18
○ Sunday
Week 17, Day 1, 23-April-18
○ Revision and preparation of Exams.
Week 17, Day2, 24-April-18
○ Revision and preparation of Exams.
Week 17, Day 3, 25-April-18
○ Revision and preparation of Exams.
Week 17, Day 4, 26-April-18
○ Revision and preparation of Exams.
Week 17, Day 5, 27-April-18
○ Test chapter :3
Week 17, Day 6, 28-April-18
○ Revision and preparation of Exams.
Week 17, Day 7, 29-April-18
○ Sunday
Week 18, Day 1, 30-April-18
○ Revision and preparation of Exams.