**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Even Semester**

**Session (2018-19)**

**Class: B.Sc 6th Sem/B.Sc. (Hons.)4th Sem Name of the Teacher: Rajwinder Singh**

**Subject: Physics Period : 1st /5th**

**Paper : A Room No : 129/319**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 14 /01/2019 – 19/01/2019 | Lattice Dynamics, Lattice vibrations and phonons  Statistics and Probability: Measures of central tendency, Arithmetic mean, median, mode, Geometric mean |
| Week 2 | 21/01/2019 –  25/01/2019 | Scattering of photons by phonons, Dynamics of a linear chain of similar atoms  Harmonic mean, Quartiles, deciles and percentiles. Measures of dispersion : Standard deviation, mean deviation, semi-interquartile range, coefficient of variation, |
| Week 3 | 28/01/2019 –  2/02/2019 | Scattering of photons by phonons, Dynamics of a linear chain of two types of atoms, optical and acoustic modes  Moments, Skewness and Kurtosis. Linear Correlation and Regression for Two Variables only. |
| Week 4 | 4/02/2019 –  9/02/2019 | Density of modes, Einstein theory of specific heats of solids  Conditional probability, probability distributions,Mathematical expectation, Probability and Combinatorial analysis |
| Week 5 | 11/02/2019 –  16/02/2019 | Debye theory of specific heats of solids  Counting Statistics and Error Prediction: Characterization of Data,Binomial, Normal and Poisson distributions and their applications |
| Week 6 | 18/02/2019 –  23/02/2019 | Magnetic classification of materials (Dia, para,ferro, ferri, antiferro) Langevin theory of dia and paramagnetism  Estimation of the Precision of a Single Measurement, Measure of  consistency of observed fluctuations with expected Statistical fluctuation |
| Week 7 | 25/02/2019 –  02/03/2019 | Quantum theory, Weiss’s theory of Ferromagnetism, temperature dependence, hysteresis of ferromagnetic materials  Chi square, Error Propagation, Distribution of time intervals between successive random events. |
| Mid Semester Exam | | |
| Week 8 | 11/03/2019 –  16/03/2019 | Dielectric constant & polarizability, electric susceptibility  Numerical Techniques: Solution of Algebraic and Transcendental Equations:Bisection Method |
| Week 9 | 18 /03/2019 –  22/03/2019 | Clausius Mosotti equation, frequency dependence  Solution of Algebraic and Transcendental Equations:  Secant Method, Newton-Raphson Method. |
| Week 10 | 25/03/2019 –  30/03/2019 | ferroelectrics and Piezoelectrics, Liquid crystals, various types and properties , Applications  Interpolation : Finite difference interpolation wit  h equal intervals, Newton’ Forward and Backward  Interpolation Formulae |
| Week 11 | 1/04/2019 –  6/04/2019 | Superconductivity,Meisner effect, London’s equation and penetration depth, critical magnetic field and temperature  Interpolation with unequally spaced points, Lagrange’s interpolation formula |
| Week 12 | 8/04/2019 –  12/04/2019 | DC and AC Josephson effect, BCS theory(formation of cooper pairs), ground state and energy gap.  Extrapolation,Numerical integration by Trapezoidal, Weddle’s and  Simpson’s rules, Romberg integration. |
| Week 13 | 15/04/2019 –  20/04/2019 | Basic ideas of materials at nanoscale: Difference from bulk material properties  Numerical differentiation by Newtons’s forward and backward difference formulae, divided difference formula |
| Week 14 | 22/04/2019 –  27/04/2019 | Nanoparticles, introduction to fabrication and characterization  Techniques  Numerical solution of differential equations, Euler’s and Runge-Kutta Method. |
| Week 15 | 29 /04/2019 –  3/05/2019 | Carbon Nanostructures - nanotubes, graphene. Applications  of nanotechnology in various fields.  Method of least-squares fitting of straight line, parabola and exponential curves, least squares fitting for any non-linear function by iterative method |