Post Graduate Government College for Girls, Sector-42, Chandigarh

**Teaching Plan for Bachelors (Third and Fifth Semester) and Post Graduate (Third Semester)**

**Session (2020-2021)**

**Class: BSc III 5th sem**  **Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Physics Paper: Nuclear Physics**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Dates** | **Topics to be Covered** |
| Week 1 | 03/08/2020 – 08/08/2020 | Introduction, Rutherford scattering Expt., Distance of closest approach |
| Week 2 | 10/08/2020 – 14/08/2020 | Constituents of nuclei, p-e theory, p-n theory, Nuclear Size, Nuclear Shapes, Nuclear mass, Nuclear Energy, Nuclear Density, Charge,Wave Mechanical properties, Parity, statistics, Angular Momentum, Magnetic Moment |
| Week 3 | 17/08/2020 – 22/08/2020 | Quadrupole moment, Isotopes, isotones, Isobars, Nuclear Forces and its Properties, Mass defect, Packing Fraction, Binding energy and its curve |
| Week 4 | 24/08/2020 – 29/08/2020 | Analogy between drop of a liquid and nucleus, Fission Model, Liquid Drop Model, Assumptions, Binding Energy Terms |
| Week 5 | 31/08/2020- 05/09/2020 | Failures and Success of LDM, Experimental evidence of Magic numbers. |
| Week 6 | 07/09/2020- 12/09/2020 | Shell Model, Energy Level Diagram, Success and Failure of LDM, Nuclear Stability |
| Week 7 | 14/09/2020- 19/09/2020 | Natural Radioactivity, Properties of alpha, beta and gamma rays, Difference between gamma and X rays |
| Week 8 | 21/09/2020- 26/09/2020 | Fundamental laws and Rutherford law of decay, decay constant, half life, average life, Activity, Units, Series, Branching |
| Week 9 | 28/09/2020- 03/10/2020 | Laws of Successive disintegration, Radiation damage, velocity, range, Geiger nuttal law, energetics, Nuclear potential, Gammow theory, Alpha spectra |
| Week 10 | 05/10/2020- 10/10/2020 | Beta decay, neutrino postulate, Energy conditions, Inverse beta decay, Internal conversion |
| Week 11 | 12/10/2020- 16/10/2020 | Types of nuclear rxns, Conservation laws, Kinematics, Physical significance of Q value, Nuclear cross-section |
| Week 12 | 19/10/2020- 24/10/2020 | Compound Nucleus, Artificial radioactivity, radio isotopes, radio carbon dating, Geological dating |
| Week 13 | 27/10/2020- 30/10/2020 | Rutherford scattering, impact parameter, Distance of closest approach, Coulomb scattering, |
| Week 14 | 03/11/2020- 07/11/2020 | Neutron, energy classification, mass of neutron, Nuclear fission |
| Week 15 | 09/11/2020- 12/11/2020 | Nuclear chain reaction, nuclear reactor, Reactor Facilities, Nuclear Fusion |
| Week 16 | 16/11/2020- 21/11/2020 | Revision tests, Numericals |
| Week 17 | 23/11/2020- 28/11/2020 | Revision tests, Numericals |

# Post Graduate Govt. College for Girls, Sector-42, Chandigarh

**Teaching Plan for Bachelors (First Semester)**

**Session (2020-2021)**

**Class: \*Bsc I N.M, C.Sc, IT**

**\*\*Bsc I Biotech Hns Name of the Teacher: Dr Harjeet Kaur**

**Subject: Physics Paper: B**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Dates** | **Topics to be Covered** |
| Week 1 | 01/09/2020-05/09/2020 | \*Periodic Motion, Defns, SHM, displacement, velocity, accel, Projection, Graphical, Diffn eqn  \*\*Laws of radioactivity, decay law, decay constant, half life, activity |
| Week 2 | 07/09/2020-12/09/2020 | \*Energy of SHM, Types of SHM, Eqn of Diffn SHM  \*\*Average life, Units, Uses of radio isotopes, Radio carbon dating |
| Week 3 | 14/09/2020-19/09/2020 | \*Compound pendulum, Torsional Pendulum, Transverse Vib Time Period  \*\*Photoelectric effect and its laws, X ray diffraction, Bragg law |
| Week 4 | 21/09/2020-26/09/2020 | \*Electrical Oscillations, Energy, Analogy between mechanical and electrical Osc  \*\*Compton scattering, Change in wavelength, Direction, Kinetic energy |
| Week 5 | 28/09/2020-03/10/2020 | \*Composition of two perp SHM of same period , ratio 1:2  \*\*DeBroglie Hypothesis, Wavelength, Phase velocity, Group velocity and their relation |
| Week 6 | 05/10/2020-10/10/2020 | \*Damped Mechanical oscillations equation and its soln, Types of damping  \*\*Uncertainity principle, Applications |
| Week 7 | 12/10/2020-16/10/2020 | \*Logarithmic Decrement, Relaxation Time, Q factor, Damped Electrical osc, Applications  \*\* Electron microscope, Coulomb law, electric field |
| Week 8 | 19/10/2020-24/10/2020 | \*Diffn equation of forced osc, Behavior with frequency  \*\* electric field on axial line and equatorial line, electric flux |
| Week 9 | 27/10/2020-30/10/2020 | \*Velocity of forced mech osc, Variation with phase and frequency  \*\*Gauss thm and its applications, electric potential |
| Week 10 | 03/11/2020 – 07/11/2020 | \*Acceleration and its variation, electrical osc, and its variations  \*\*Potential on axial and equatorial line, As line integral of electric field |
| Week 11 | 09/11/2020 – 12/11/2020 | \*Power supplied and its variations, band width, Q factor  \*\*Capacitance, series and parallel, Energy stored |
| Week 12 | 16/11/2020 – 21/11/2020 | \*Relation between Q factor and band width, Amplification factor, ohm law  \*\*Current, current density, equation of continuity |
| Week 13 | 23/11/2020 – 28/11/2020 | \*Coupled oscillator and its equations, Normal coordinates, modes, in phase and out phase, shape  \*\*Ohms law, Numericals |
| Week 14 | 01/12/2020 – 05/12/2020 | \*Exchange of energy, and its equations, Characteristics  \*\* revision tests, Numericals |
| Week 15 | 07/12/2020 – 12/12/2020 | \*determination of normal modes, Inductive coupling  \*\* revision tests, Numericals |
| Week 16 | 14/12/2020 – 18/12/2020 | Revision |
| Week 17 | 21/12/2020 – 26/12/2020 | Revision |