**Summary of Lesson Plans of College Faculty**

**Name of college:** CMG GCW Bhodia khera, Fatehabad

**Academicsession**: 2022-23 **Class/Semester:**B.Sc.IIIrdYear(VSem.)

**Month:August ,September Name of Assistant Professor:** Mrs.Rita

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr. No. | Subject | Topics/ Chapters to be covered | Academic Activity to be organized | Topic of Assignment/ Tests to be given to the students |
| 1 | Physics |  |  |  |
|  | Quantum mechanics | Overview, scale of quantum physics boundary between classical and quantum phenomena, Photon, Photoelectric effect, Compton effect (theory and result), Frank-Hertzexperiment de-Broglie hypothesis. Davisson and Germer experiment, G.P.Thomson experiment. Phase velocity, group velocity and their relation. Heisenberg's uncertainty principle. Time energy and angular momentum position uncertainty. Uncertainty principle from de Broglie wave. (Wave-particle duality). Gamma Ray Microscope, Electron diffraction from a slit. Derivation of 1-D time-dependent Schrodinger wave equation (subject to force, free particle). Time-independent Schrodinger wave equation, eigen values, eigen functions wave functions and its significance. Orthogonality and Normalization of function, concept of observer and operator, Expectation values of dynamical quantities, probability current density.Free particle in one-dimensional box (solution of Schrodinger wave equation, eigen functions, eigen values, quantization of energy and momentum, nodes and anti nodes, zero point energy  . | Problems of the chapter will be discussed | Test of basics |

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**Aacademic session**: 2022-23 **Class/Semester:**B.Sc. IIIrd Year (V Sem.) **Month:September**

**Name of Assistant Professor:** Mrs. Rita

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| Sr. No. | Subject | Topics/ Chapters to be covered | Academic Activity to be organized | Topic of Assignment/ Tests to be given to the students |
| 1 | Physics |  |  |  |
|  | Quantum mechanics | One dimensional step potential E > Vo (Reflection and Transmission coefficient),One dimensional step potential E < Vo (penetration depth calculation), One dimensional potential barrier, E > Vo (Reflection and Transmission coefficient)  One-dimensional potential barrier, E < Vo (penetration or tunneling coefficient), Solution of Schrodinger equation for harmonic oscillator (quantization of energy, Zero-point energy, wave equation for ground state and excited states), Absorption and emission of radiation  Main features of a laser: Directionality, high intensity, high degree of coherence, spatial and temporal coherence, Einstein's coefficients and possibility of amplification, momentum transfer, life time of a level, kinetics of optical absorption ((two and three level rate equation, Fuchbauer landerburg formula).population inversion: A necessary condition for light amplification, resonance cavity, laser pumping, Threshold condition for laser emission, line broadening mechanism, homogeneous and inhomogeneous line broadening (natural, collision and  Doppler broadening). | Problems were discussed. | Assignments was assigned |

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**Academic session**: 2022-23 **Class / Semester:** B.Sc. IIIrd Year (V Sem.)

**Month:** October **Name of Assistant Professor:** Mrs. Rita

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr. No. | Subject | Topics/ Chapters to be covered | Academic Activity to be organized | Topic of Assignment/ Tests to be given to the students |
| 1 | Physics |  |  |  |
|  | Laser physics and Nuclear physics | He-Ne laser and RUBY laser (Principle, Construction and working), Optical properties of semiconductor,  Semiconductor laser (Principle, Construction and working),  Applications of lasers in the field of medicine and industry. Nuclear composition (p-e and p-n hypotheses), Nuclear properties; Nuclear size, spin, parity, statistics, magnetic dipole moment, quadrouple moment (shape concept). Determination of mass by Bain-Bridge, Bain-Bridge and Jordan mass spectrograph. Determination of charge by Mosley Law. Determination of size of nuclei by Rutherford Back Scattering. mass and binding energy, systematic of nuclear binding energy, nuclear stability Alpha-disintegration and its theory. Energetics of alpha-decay, Origin of continuous beta  Spectrum (neutrino hypothesis), types of beta-decay and energetics of beta-decay. Nature of gamma rays, Energetics of gamma rays. | Problems and Discussion was done among students | Test of the chapters were conducted, assignment was assigned. |

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**Academic session**:2022-23

**Class/Semester:**B.Sc.IIIrd Year (V Sem.) **Month:**Ocober to December **Name of Assistant Professor:** Mrs. Rita

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr. No. | Subject | Topics/ Chapters to be covered | Academic Activity to be organized | Topic of Assignment/ Tests to be given to the students |
| 1 | Physics |  |  |  |
|  | Nuclear Physics | Interaction of heavy charged particles (Alpha particles); Energy loss of heavy charged  particle (idea of Bethe formula, no derivation), Range and straggling of alpha particles.  Geiger-Nuttal law. Interaction of light charged particle (Beta-particle), Energy loss of  beta-particles (ionization), Range of electrons, absorption of beta-particles. Interaction of  Gamma Ray; Passage of Gamma radiations through matter (Photoelectric, Compton and  pair production effect) electron-positron annihilation. Absorption of Gamma rays (Mass  attenuation coefficient) and its application.  Linear accelerator, Tendem accelerator, Cyclotron and Betatron accelerators.  Gas filled counters; Ionization chamber, proportional counter, G.M. Counter (detailed  study), Scintillation counter and semiconductor detector.  Nuclear reactions, Elastic scattering, Inelastic scattering, Nuclear disintegration,  Photonuclear reaction, Radiative capture, Direct reaction, Heavy ion reactions and  spallation Reactions. Conservation laws, Q-value and reaction threshold.  Nuclear Reactors, General aspects of Reactor Design. Nuclear fission and fusion reactors, | Problems and Discussion was done among students | Test of the chapters were conducted, assignment was assigned. |