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

**Teaching Plan Session Even Semester**

**(2017-18)**

**Class: BSC II Name of the Teacher: Kamlesh Kumari**

**Subject: Physics Period: 2017-18**

**Paper: Room No:**

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| **S. No** | **Date From** | **Date Upto** | | | **Topics to be covered** |
| Week 1 | Jan 08, 2018 | Jan 13, 2018 | | | Interaction of light with matter: Absorption, spontaneous emission, stimulated emission, Wave mechanical explanation, |
| Week 2 | Jan 15, 2018 | Jan 20, 2018 | | | Properties of spectral lines, Temporal and spatial coherence, Characteristics of stimulated emission , Einstein coefficients and their relations, |
| Week 3 | Jan 22, 2018 | Jan 27, 2018 | | | Light amplification and threshold condition, Population inversion, Kinetics of optical absorption( qualitative account only). |
| Week 4 | Jan 29, 2018 | Feb 3, 2018 | | | Statistical definition of entropy, change of entropy of a system, additive nature of entropy, law of increaseof entropy, reversible and irreversible processes with examples. Work done in a reversible process.Examples of increase of entropy in natural processes. Entropy and disorder. |
| Week 5 | Feb 5, 2018 | Feb 10, 2018 | | | Qualitative account of collision broadening .Doppler broadening & natural broadening, Mechanism of Luminescence. |
| Week 6 | Feb 12, 2018 | Feb 17, 2018 | | | Brief review of the terms and  Laws of Thermodynamics, Carnot’s Cycle. Entropy changes in Carnot’s Cycle. Applications ofthermodynamics to thermoelectric effect, change of entropy along a reversible path in a P.V. diagram, |
| Week 7 | Feb 19, 2018 | Feb 24, 2018 | | | Lasing action, components of laser. Elementary theory of optical cavity, Longitudinal and transverses modes, Principal pumping schemes. Three level and four level laser schemes. |
| Week 8 | Feb 26, 2018 | Mar 03 , 2018 | | | Laser systems : Types of lasers, Ruby and Nd : YAG lasers ,He-Ne laser. |
| **2nd week March (Mid Semester Exam)** | | | | | |
| Week 9 | March 15, 2018 | | March 17, 2018 | Entropy of a perfect gas. Equation of state of ideal gas from simple statistical consideration. Heat death ofthe universe.  Derivation of Maxwell’s thermodynamical relations and applications ,cooling produced byadiabatic stretching, adiabatic  compression, change of internal energy with volume. | |
| Week 10 | March 19 , 2018 | | March 24, 2018 | N2, Dye and co2 lasers - construction , mode of creating population inversion and output characteristics.Application of lasers- a general outline, Holography- Principle, recording of hologram and reconstruction of image. | |
| Week 11 | March 26, 2018 | | March 31, 2018 | Numerical problems and class test. | |
| Week 12 | April 02, 2018 | | April 07, 2018 | Fibre optics : Photonics ,optical fibre, construction, Numerical aperture, acceptance angle, skip distance,  Step index fibre - single mode and multimode, Graded index fibre . | |
| Week 13 | April 09, 2018 | | April 14 , 2018 | Expression for (Cp-Cv), change of state andClayperon Equation.Thermodynamical treatment of Joule-Thomson effect. Use of Joule-Thomson effectfor liquefaction of helium. Production of very low temperature by adiabatic demagnetization. | |
| Week 14 | April 16, 2018 | | April 21, 2018 | Numerical problems and class test. | |
| Week 15 | April 23, 2018 | | April 28, 2018 | Losses in optical fibre, Material losses and Rayleigh scattering, bending losses ,Intermodal and intramodal dispersion. | |
| Week 16 | April 30, 2018 | | May 05, 2018 | Splicing techniques, optical fibre based communication system,Medical applications , Displacement sensor, temperature sensor, force sensor, humidity sensor. | |