Lesson plan 2023-24
Physics Paper -1
Atomic, Molecular and Laser Physics
B.Sc. 6th Sem
Amar Singh (Extension Lecturer)
SMSD GOVT COLLEGE NANGAL CHAUDHARY

3rd Week of January month

- Introduction of unit 1st
- Vector atom model
- Quantum numbers associated with vector atom model

4rth week of January month

- Penetrating and non penetrating orbits
- Spectral lines in different series of alkali spectra

1st week of February month

- Spin orbit interaction and doublet term separation
- LS and JJ Coupling Schemes

2nd week of February month

- Numerical Problems of unit 1st
- Introduction of unit 2nd
- Zeeman effect (Normal and Anormalous)

3rd Week of February month

- Quantum theory of Anormalous Zeeman effect
- D1 and D2 lines of Na atom

4rth week of February month

- Paschen Back effect of a single valence electron system
- P.B. effect of principle series doublet of Sodium
- Difference between Anomalous Zeeman effect and Paschen Back effect

1st week of March month

- Stark Effect
- Difference between Zeeman effect and Stark Effect
- Weak field Stark effect in Hydrogen

2nd week of March month

- Molecular spectra and Rotational spectra
- Quantisation of vibrational and rotational energies
- Raman effect

3rd Week of March month

- Stokes and anti stokes lines
- - Introduction of unit 3rd (Laser)
- Main features of laser- Directionality

1st week of April month

- High intensity, high degree of coherencies
- Spatial and temporal coherence
- Einstein's coefficients and possibility of amplification

2nd week of April month

- Momentum transfer
- Life time of a level
- Kinetic of optical absorption
- Threshold condition for laser emission

3rd Week of April month

- Laser pumping
- He-Ne laser (principle, construction and working)
- Ruby laser (principle, construction and working)

4rth week of April month

- Applications of laser in the field of medicine and industry
- Revision

S.M.S.D GOVT COLLEGE, NAINCAL CHOLDHAR (M/GARH)

LESSON PLAN FOR SESSIONS:- 2023-24

NAME:- DR. HEMANT KUMAR SHARMA (EVEN SEM)

CLASS:- B.Sc. IIIRD YEAR (6TH SEMESTER)

SUBJECT:- PHYSICS (PAPER-IIND)

=> JAN-2024 (WEEK-1ST) [12 JAN TO 27 JAN]

* NUCLEAR MASS AND BINDING ENERGY.
* SYSTEMATICS BINDING ENERGY.
* NUCLEAR STABILITY.

=> WEEK-2ND [29 JAN TO 03 FEB]

* NUCLEAR SIZE, SPIN, PAIRTY.
* STATISTICS, MAGNETICS DIPOLE MOMENT.
* QUADRUPOLE MOMENT (SHAPE CONCEPT)

=> FEB-2024 (WEEK-1ST) (05 FEB TO 10 FEB)

* DETERMINATION OF MASS BAIN-BRIDGE & JORDAN MASS SPECTROGRAPH.
* DETERMINATION OF CHARGE BY MOSLEY LAW.

=> WEEK-2ND (12 FEB TO 17 FEB)

* DETERMINATION OF SIZE OF NUCLEI BY RUTHERFORD BACK SCATTERING.
* INTERACTION OF HEAVY CHARGED PARTICLES
* ALPHA disintegration and its theory.
* ENERGY LOSS OF HEAVY CHARGED PARTICLE.

(P.T.O.)

EK-3RD (19 FEB TO 24 FEB)

* ENERGETICS OF ALPHA-DECAY
* RANGE AND STRAGGLING OF α-PARTICLES.
* GEIGER-NUTTAL LAW.

=) WEEK-4TH [26 FEB TO 02 MARCH]

* INTRODUCTION OF LIGHT CHARGED PARTICLES (BETA-PARTICLE)
* ORIGIN OF CONTINUOUS BETA-SPECTRUM (NEUTRINO-HYPOTHESIS)
* TYPES OF BETA DECAY.

=) MARCH-2024 (WEEK-1ST) (04 MARCH TO 09 MARCH)

* ENERGY LOSS OF BETA-PARTICLES (IONIZATION)
* RANGE OF ELECTRONS
* ABSORPTION OF BETA PARTICLES.

=) WEEK-2ND (18 MARCH TO 22 MARCH)

* INTERACTION OF GAMMA RAY
* NATURE OF GAMMA RAYS
* ENERGETICS OF GAMMA RAYS

=) APRIL-2024 (WEEK-1ST) (01 APRIL TO 06 APRIL)

* PASSAGE OF GAMMA RADIATIONS THROUGH MATTER.
* ELECTRON POSITION ANNILATION.
* ABSORPTION OF GAMMA RAYS AND ITS APPLICATION.
* NUCLEAR REACTIONS
* ELASTIC SCATTERING, IN-ELASTIC SCATTERING

(P.T.O.)

WEEK-2ND (08 APRIL TO 13 APRIL)

* NUCLEAR DISTINTEGRATION.
* PHOTO NUCLEAR REACTION.
* RADIOACTIVE CAPTURES.
* DIRECT REACTION.
* HEAVY ION REACTIONS.

=) WEEK-3RD (15 APRIL TO 20 APRIL)

* SPACLATION REACTIONS
* CONSERVATION LAWS
* Q-VALUE.
* THRESHOLD REACTION.
* NUCLEAR REACTOR.
* NUCLEAR FISSION AND FUSION REACTORS
* LINEAR ACCELERATOR, TENDEN ACCELERATOR.

=) WEEK-4th (21 APRIL TO ONWARD)

* CYCLOTRON AND BETATRON ACCELERATOR.
* IONIZATION CHAMBER
* PROPORTIONAL COUNTER.
* G.M. COUNTER.
* SCINTILLATION COUNTER.
* SEMICONDUCTOR DETECTOR.

* REVISION AND CLASS TEST *

Hemant.