

Dr. B.R. Ambedkar Govt. College, Palwal
Lesson plan 2021-2022

Name of Assistant Professor: Anil Chauhan
Class and section: B.Sc 3rd Year (6th Sem)
Subject: Physics Paper 2 (Nuclear Physics)

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| Week 1 | Unit: 1st |
| | <ul style="list-style-type: none">• About nuclear and mass size etc definitions• Nuclear mass and binding energy• Systematic nuclear binding energy |
| Week 2 | |
| | <ul style="list-style-type: none">• Nuclear stability• Nuclear size• 1 Nuclear spin and parity |
| Week 3 | |
| | <ul style="list-style-type: none">• Statistics magnetic dipole moment• Quadrupole moment (shape concept)• Determination of mass by Bain-Bridge |
| Week 4 | |
| | <ul style="list-style-type: none">• Bain-Bridge and• Jordan mass spectrograph• Determination of charge by Mosley law Determination of size of nuclei by Rutherford Back Scattering |
| Week 5 | |
| Test Unit 1st | Unit 2nd |
| | <ul style="list-style-type: none">• Interaction of heavy charged particles (Alpha particles)• Alpha disintegration• And its theory Energy loss of heavy charged particle (idea of Bethe formula, no derivation) |
| Week 6 | |
| | <ul style="list-style-type: none">• Energetic of alpha –decay• Range and straggling of alpha particles• Geiger-Nuttal law |
| Week 7 | |
| | <ul style="list-style-type: none">• Introduction of light charged particle (Beta-particle)• Origin of continuous beta-spectrum• Types of beta decay and energetic of beta decay. |

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| Week 8 |
| <ul style="list-style-type: none"> • Energy loss of beta- particles (ionization) • Range of electrons, absorption of beta-particles • Interaction of Gamma Ray |
| Week 9 |
| <ul style="list-style-type: none"> • Nature of gamma rays • Energetics of gamma rays • Passage of Gamma radiations through matter |
| Week 10 |
| <ul style="list-style-type: none"> • Photoelectric, Compton and pair production effect) • Electron positron annihilation • Absorption of Gamma rays and its application. |
| Week 11 |
| Test unit 2nd |
| Unit 3rd |
| <ul style="list-style-type: none"> • Nuclear reactions, • Elastic scattering • Inelastic scattering • Nuclear disintegration |
| Week 12 |
| <ul style="list-style-type: none"> • Photo nuclear reaction, • Radiative capture • Direct reaction • Heavy ion reactions and spallation Reactions • Conservation laws and Q-value and reaction threshold |
| Week 13 |
| <ul style="list-style-type: none"> • Nuclear Reactors General aspects of Reactor design • Nuclear fission reactors (Principles, construction, working and use) • Nuclear fusion reactors (Principles, construction, working and use) |
| Week 14 |
| <ul style="list-style-type: none"> • Linear accelerator, Tandem accelerator • Cyclotron and Betatron accelerators. • Ionisation chamber • Proportional counter, G.M. counter detailed study |
| Week 15 |
| <ul style="list-style-type: none"> • Scintillation counter and semiconductor detector. • Test Unit 3rd • Revision |

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| Week 16 |
| <ul style="list-style-type: none">• Revision• Revision• Revision |