

DEPARTMENT OF PHYSICS  
LESSION PLAN  
SESSION 2023-24  
SEMESTER – IV

NAME OF TEACHER: DR. GOUTAM BISWAS

PAPER ALLOTTED: PHSACOR09T, PHSACOR09P

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	PHSACOR09T  <i>(Elements of Modern Physics)</i>	<u>Relativistic Dynamics:</u> Relativistic mass. Relativistic energy. Rest energy. Equivalence of mass & energy	02
		<u>Lasers</u> An introductory Class will be taken on recent development on Laser science and its application through projection techniques.  Lasers: Einstein's A and B coefficients	03
	PHSACOR09P	<ol style="list-style-type: none"> <li>1. To determine the wavelength of laser source using diffraction of single slit.</li> <li>2. To determine the wavelength of laser source using diffraction of double slits.</li> <li>3. To determine the ionization potential of mercury</li> </ol>	05
April 2024	PHSACOR09T  <i>(Elements of Modern Physics)</i>	<u>Relativistic Dynamics:</u> [Part -A] Invariance of space-time interval under Lorentz transformation. Idea of 4-vector – contravariant and covariant components, metric. 4-scalar. Space-like, time-like and light-like separation, causality in relativity.	03
		<u>Lasers:</u> Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion.	03
	PHSACOR09P	<ol style="list-style-type: none"> <li>1. To determine the Planck's constant using LEDs of at least 4 different colours.</li> <li>2. To determine angular spread of He-Ne/ solid state laser using plane diffraction grating.</li> <li>3. To determine the value of e/m by Bar magnet.</li> </ol>	06
May 2024	PHSACOR09T  <i>(Elements of Modern Physics)</i>	<u>Relativistic Dynamics:</u>  [ Part-B] Proper time. 4-velocity and 4-momentum. Conservation law of 4- momentum.	02

		[ Part-C] Applications in two body decay of a particle, two body Collisions	02
	PHSACOR09P	1. To determine the wavelength of H-alpha emission line of Hydrogen atom. 2. To determine the absorption lines in the rotational spectrum of Iodine vapour.	05
June 2024	PHSACOR09T (Elements of Modern Physics)	<u>Lasers:</u> Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. Basic lasing.	02
	PHACOR09P	1.To determine work function of material of filament of directly heated vacuum diode.	02
June 2024 within 07.06.2024	PHSACOR09T (Elements of Modern Physics)	Discussion on various problems on topics (i) Relativistic dynamics (ii) Laser optics	02
		Internal Examination & Class for Slow Learners	01
13.07.2024		End Semester Examination	
Total Classes			38

NAME OF TEACHER: **DR. INDRANIL BHATTACHARYYA**

PAPER ALLOTTED: PHSACOR08T (MATHEMATICAL PHYSICS III), PHSACOR09T (MODERN PHYSICS), PHSGCORO4T (WAVE OPTICS), PHSGCORO4P

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	PHSACOR08T	Hermitian conjugate of a Matrix. Hermitian and Skew-Hermitian Matrices with properties. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Inner Product of matrices (for the slow learners/weaker students = 1 extra class)	7+1=8
	PHSACOR09T	Planck's quantum postulate to avoid ultraviolet catastrophe, Planck's constant and Planck's distribution law for blackbody Radiation. Photo-electric effect and Compton scattering. Light as a collection of photons; WilsonSommerfield quantization rule unifying Planck's quantization rule and Bohr's angular momentum quantization rule. De Broglie wavelength and matter waves; Davisson-Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. (for the slow learners/weaker students = 1 extra class)	7+1=8

	PHSGCOR04T	Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films.	6
	PHSGCOR04P	1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $\lambda^2 \propto T$ law. 2. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method). 3. To determine refractive index of the Material of a prism using sodium source.	6
April 2024	PHSACOR08T	Eigenvalues and eigenvectors – calculation, characteristic equation. Cayley- Hamilton Theorem. Similarity transformation with properties. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary Differential Equations. Functions of a Matrix. (for the slow learners/weaker students = 2 extra class)	8+2=10
	PHSACOR09T	Position measurement- gamma ray microscope thought experiment; Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables) as a consequence of wave description. Estimating minimum energy of a confined particle using uncertainty principle. Energy-time uncertainty principle- application to virtual particles and range of an interaction. (for the slow learners/weaker students = 1 extra class)	7+1=8
	PHSGCOR04T	Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index Idea of form of fringes (no theory needed), Determination of wavelength, Wavelength difference, Refractive index, and Visibility of fringes.	7
	PHSGCOR04P	4. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source. 5. To determine wavelength of sodium light using Fresnel Biprism.	6
May 2024	PHSACOR08T	(for the slow learners/weaker students = 3 extra class)	3
	PHSACOR09T	Two-Slit interference experiment with electrons and photons. Wave-particle duality, Bohr's complementarity principle. Matter waves and wave function, linear superposition principle as a consequence; Born's probabilistic interpretation of wave function bridging between wave description and particle description. (for the slow learners/weaker students = 1 extra class)	6+1=7
	PHSGCOR04T	Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones.	7

	PHSGCOR04P	6. To determine wavelength of sodium light using Newton's Rings. 7. To determine dispersive power and resolving power of a plane diffraction grating.	6
June 2024	PHSACOR08T	Remedial Class for Slow Learners/ weaker students	3
	PHSACOR09T		3
	PHSGCOR04T	Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using halfperiod zone analysis	7
within 07.06.2024		Internal Examination	
July 2024		Class for Slow Learners	6
13.07.2024		END SEMESTER EXAMINATION	
Total Classes			101

NAME OF TEACHER: DR. ANANDA SARKAR

PAPER ALLOTTED: PHSACOR08T, PHSGCOR04P

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	PHSACOR08T	<b>Integrals Transforms:</b> Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral.	7
	PHSGCOR04P	1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $\lambda^2 - T$ law.	4
April 2024	PHSACOR08T	<b>Integrals Transforms:</b> Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (Translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations.	8
	PHSGCOR04P	2. To determine wavelength of sodium light using Newton's Rings. 3. Familiarization with: Schuster's focusing determination of angle of prism. 4. To determine refractive index of the Material of a prism using sodium source.	8
May 2024	PHSACOR08T	<b>Matrices:</b> Hermitian conjugate of a Matrix. Hermitian and Skew-Hermitian Matrices with properties. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Inner Product of matrices. Eigen-values and Eigenvectors:	10

		Eigenvalues and eigenvectors – calculation, characteristic equation. Cayley- Hamilton Theorem. Problem solving classes.	
	PHSGCOR04P	5. To determine dispersive power and resolving power of a plane diffraction grating. 6. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.	4
within 07.06.2024 June 2024	PHSACOR08T	Internal Examination & Class for Slow Learners	6
	PHSACOR08T	Collection of Identical Entities – Classical Approach: Large collection of identical entities in an enclosure at thermal equilibrium. Idea of averaging over the collection, relation with bulk variables. Boltzmann weight factor. Law of equipartition of energy for single entity. Example: Cavity radiation and black body, classical theory of blackbody radiation, Rayleigh-Jeans law. Ultraviolet catastrophe.	6
	PHSGCOR04P	7. To determine wavelength of sodium light using Fresnel Biprism.	4
July 2024	PHSACOR08T	Eigen-values and Eigenvectors: Similarity transformation with properties. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary Differential Equations. Functions of a Matrix.	4
13.07.2024		END SEMESTER EXAMINATION	
Total Classes			55

NAME OF TEACHER: DR. SAURISH CHAKRABARTY

PAPER ALLOTTED: PHSACOR08T: MATHEMATICAL PHYSICS III, PHSACOR08P:  
MATHEMATICAL PHYSICS III LAB, PHSACOR09T: MODERN PHYSICS,  
PHSSSECO2M: COMPUTATIONAL PHYSICS SKILLS

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	PHSACOR08T	<ul style="list-style-type: none"> <li>● Complex Analysis <ul style="list-style-type: none"> <li>○ Euler's formula</li> <li>○ de Moivre's theorem</li> <li>○ Roots of Complex Numbers</li> <li>○ Functions of Complex Variables</li> <li>○ Analyticity and Cauchy-Riemann Conditions</li> </ul> </li> </ul>	4
	PHSACOR08P	<ul style="list-style-type: none"> <li>● Assignments 1, 2, 3</li> <li>● First Internal Assessment Examination</li> </ul>	8
	PHSACOR09T	<ul style="list-style-type: none"> <li>● Collection of Identical Entities - Classical Approach <ul style="list-style-type: none"> <li>○ Large collection of identical entities in an enclosure at thermal equilibrium</li> <li>○ Idea of averaging over the collection</li> <li>○ Relation with bulk variables</li> </ul> </li> </ul>	3

		<ul style="list-style-type: none"> <li>○ Boltzmann weight factor</li> </ul>	
	PHSSSEC02M	<ul style="list-style-type: none"> <li>● Scientific Programming</li> <li>○ Some fundamental Linux Commands</li> <li>○ Basic elements of FORTRAN 90 <ul style="list-style-type: none"> <li>■ Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program</li> <li>■ Operators: Arithmetic, Relational, Logical and Assignment Operators</li> </ul> </li> </ul>	4
April 2024	PHSACOR08T	<ul style="list-style-type: none"> <li>● Complex Analysis (continued) <ul style="list-style-type: none"> <li>○ Examples of analytic functions</li> <li>○ Singular functions: poles and branch points, order of singularity, branch cuts</li> <li>○ Integration of a function of a complex variable <ul style="list-style-type: none"> <li>○ Cauchy's Inequality</li> <li>○ Cauchy's Integral formula</li> </ul> </li> </ul> </li> </ul>	8
	PHSACOR08P	<ul style="list-style-type: none"> <li>● Assignments 4,5,6,7</li> <li>● Second Internal Assessment Examination</li> </ul>	8
	PHSACOR09T	<ul style="list-style-type: none"> <li>● Collection of Identical Entities - Classical Approach <ul style="list-style-type: none"> <li>○ Law of equipartition of energy for a single entity <ul style="list-style-type: none"> <li>■ Example: Cavity radiation and black body</li> </ul> </li> <li>○ Classical theory of blackbody radiation <ul style="list-style-type: none"> <li>■ Rayleigh-Jeans law</li> <li>■ Ultraviolet catastrophe</li> </ul> </li> </ul> </li> </ul>	3
	PHSSSEC02M	<ul style="list-style-type: none"> <li>● Scientific Programming (continued)</li> <li>○ Basic elements of FORTRAN 90 (continued) <ul style="list-style-type: none"> <li>■ Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions</li> <li>■ Statements: I/O Statements, Executable and Non-Executable Statements</li> <li>■ Layout of Fortran 90/95 or C++ Program, Format of writing Program and concept of coding, Initialization and Replacement Logic <ul style="list-style-type: none"> <li>■ Examples from physics problems. <ul style="list-style-type: none"> <li>○ Control Statements</li> </ul> </li> <li>■ Types of Logic (Sequential, Selection, Repetition) <ul style="list-style-type: none"> <li>■ Branching Statements, Looping Statements, Jumping Statements</li> </ul> </li> <li>■ Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays)</li> <li>■ Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine) <ul style="list-style-type: none"> <li>■ File Handling</li> </ul> </li> </ul> </li> </ul> </li> </ul>	12

		<ul style="list-style-type: none"> <li>■ Examples from physics problems.</li> </ul>	
May 2024	PHSACOR08T	<ul style="list-style-type: none"> <li>● Complex Analysis (continued) <ul style="list-style-type: none"> <li>○ Integration of a function of a complex variable <ul style="list-style-type: none"> <li>○ Cauchy's Inequality</li> <li>○ Cauchy's Integral formula</li> </ul> </li> </ul> </li> <li>● Internal Assessment Examination</li> </ul>	6
	PHSSSEC02M	<ul style="list-style-type: none"> <li>● Scientific word processing: Introduction to LaTeX <ul style="list-style-type: none"> <li>○ TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, Preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages</li> </ul> </li> <li>○ Equation representation: Formulae and equations <ul style="list-style-type: none"> <li>○ Figures and other floating bodies</li> </ul> </li> </ul>	6
June 2024	PHSACOR08T	<ul style="list-style-type: none"> <li>● Complex Analysis (continued) <ul style="list-style-type: none"> <li>○ Simply and multiply connected region</li> <li>○ Laurent and Taylor's expansion</li> <li>○ Residues and Residue Theorem</li> <li>○ Application in solving Definite Integrals</li> </ul> </li> </ul>	6
	PHSACOR08P	<ul style="list-style-type: none"> <li>● Assignments 8,9,10</li> <li>● Third Internal Examination</li> </ul>	8
	PHSACOR09T	<ul style="list-style-type: none"> <li>● Internal Examination</li> </ul>	1
	PHSSSEC02M	<ul style="list-style-type: none"> <li>● Scientific word processing: Introduction to LaTeX (continued) <ul style="list-style-type: none"> <li>○ Lining in columns: Tabbing and tabular environments <ul style="list-style-type: none"> <li>○ Generating table of contents <ul style="list-style-type: none"> <li>○ Bibliography</li> <li>○ Index and glossary</li> <li>○ List making environments</li> </ul> </li> </ul> </li> <li>○ Fonts, Picture environment and colors, errors</li> </ul> </li> </ul>	6
13.07.2024		<b>END SEMESTER EXAMINATIONS</b>	
<b>Total Classes</b>			<b>83</b>

NAME OF TEACHER: DR. ATANU NANDY

PAPER ALLOTTED: PHSACOR10T: ANALOG SYSTEMS AND APPLICATIONS (THEORY), PHSACOR10P: ANALOG SYSTEMS AND APPLICATIONS (LAB)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	PHSACOR10T	<ul style="list-style-type: none"> <li>● Amplifiers <ul style="list-style-type: none"> <li>○ Amplifiers: Transistor Biasing and Stabilization Circuits. <ul style="list-style-type: none"> <li>○ Fixed Bias and Voltage Divider Bias.</li> <li>○ Transistor as 2-port Network.</li> </ul> </li> </ul> </li> </ul>	11

		<ul style="list-style-type: none"> <li>○ h-parameter Equivalent Circuit.</li> <li>○ Analysis of a single stage CE amplifier using Hybrid Model. <ul style="list-style-type: none"> <li>○ Input and Output Impedance.</li> <li>○ Current, Voltage and Power Gains.</li> </ul> </li> <li>○ Classification of Class A, B &amp; C Amplifiers. <ul style="list-style-type: none"> <li>• Coupled Amplifier</li> </ul> </li> <li>○ Two stage RC-coupled amplifier and its frequency response.</li> </ul>	
	PHSACOR10P	<ul style="list-style-type: none"> <li>✓ To study V-I characteristics of PN junction diode and Light emitting diode (LED)</li> <li>✓ To study the V-I characteristics of a Zener diode and its use as voltage regulator.</li> <li>✓ Study of V-I &amp; power curves of Solar Cells and find maximum power point and efficiency.</li> <li>✓ 4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.</li> <li>✓ To design inverting, non-inverting and buffer amplifiers using Op-amp (741/351) for dc voltage.</li> <li>✓ To design a Wien bridge oscillator for given frequency using an Op-Amp.</li> <li>• [After being demonstrated the Experiments are done by the student groups]</li> </ul>	10
April 2024	PHSACOR10T	<ul style="list-style-type: none"> <li>• Feedback in Amplifiers <ul style="list-style-type: none"> <li>○ Concept of feedback</li> </ul> </li> <li>○ Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. <ul style="list-style-type: none"> <li>• Sinusoidal Oscillators</li> </ul> </li> <li>○ Barkhausen's Criterion for self-sustained oscillations. <ul style="list-style-type: none"> <li>○ RC Phase shift oscillator,</li> <li>○ Determination of Frequency.</li> <li>○ Hartley &amp; Colpitts oscillators.</li> </ul> </li> <li>• Operational Amplifiers (Black Box approach)</li> <li>○ Characteristics of an Ideal and Practical Op-Amp (IC 741) <ul style="list-style-type: none"> <li>○ Open-loop and Closed-loop gain.</li> <li>○ Frequency Response.</li> <li>○ CMRR.</li> </ul> </li> <li>○ Slew Rate and concept of Virtual ground.</li> </ul>	12
	PHSACOR10P	<ul style="list-style-type: none"> <li>✓ To add dc voltages using Op-amp in inverting and non-inverting mode.</li> <li>✓ a) To investigate the use of an op-amp as an Integrator.</li> <li>✓ b) To investigate the use of an op-amp as a Differentiator.</li> <li>✓ To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.</li> <li>✓ To study the various biasing configurations of BJT for normal class A operation.</li> </ul>	10

		<ul style="list-style-type: none"> <li>✓ To design a Phase Shift Oscillator of given specification using Op-Amp.</li> <li>• [After being demonstrated the Experiments are done by the student groups]</li> </ul>	
May 2024	PHSACOR10T	<ul style="list-style-type: none"> <li>• Applications of Op-Amp               <ul style="list-style-type: none"> <li>○ Linear - (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator.</li> <li>○ Non-linear – (1) inverting and non-inverting comparators, (2) Schmidt triggers.                   <ul style="list-style-type: none"> <li>• Converter</li> </ul> </li> <li>○ Resistive network (Weighted and R-2R Ladder).                   <ul style="list-style-type: none"> <li>○ Accuracy and Resolution.</li> </ul> </li> <li>○ A/D Conversion (successive approximation)</li> </ul> </li> </ul>	9
	PHSACOR10P	<ul style="list-style-type: none"> <li>✓ To design inverting amplifier using Op-amp (741/351) and study its frequency response</li> <li>✓ To design non-inverting amplifier using Op-amp (741/351) &amp; study its frequency response</li> <li>✓ To study the zero – crossing detector and comparator.</li> <li>✓ Using Schmitt trigger and associated circuit (with OPAMP) generate different wave forms.</li> <li>• [After being demonstrated the Experiments are done by the student groups]</li> </ul>	8
June 2024 (up to 07.06.24)	PHSACOR10T	Internal Examination & Class for Slow Learners	3
	PHSACOR10P	Internal Examination & Class for Slow Learners	4
13.07.2024		END SEMESTER EXAMINATIONS	
Total Classes			67

NAME OF TEACHER: MS. ANAMIKA DAS

PAPER ALLOTTED: PHSACOR10T - ANALOG SYSTEMS AND APPLICATIONS,  
PHSACOR10P - ANALOG SYSTEMS AND APPLICATIONS LAB

Month	Paper	Topic	No. Of classes
March 2024 02.03.2024	PHSACOR10T	<p style="text-align: center;"><b>Semiconductor Diodes</b></p> <p>P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Two-terminal Devices and their Applications</p> <p>Rectifier Diode: Half-wave Rectifiers., Calculation of Ripple Factor and Rectification Efficiency, C-filter &amp; <math>\pi</math>-filter(qualitative, expression only),</p>	8+2
	PHSACOR10P	1. To study V-I characteristics of PN junction diode and Light emitting diode (LED)	10

		<p>2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.</p> <p>3. Study of V-I &amp; power curves of Solar Cells and find maximum power point and efficiency.</p> <p>4. 4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.</p> <p>5. To design inverting, non- inverting and buffer amplifiers using Op-amp (741/351) for dc voltage.</p> <p>6. To design a Wien bridge oscillator for given frequency using a Op-Amp.</p> <p>[After being demonstrated the Experiments are done by the student groups]</p>	
April 2024	PHSACOR10T	<p>Zener Diode and Voltage Regulation.</p> <p>Bipolar Junction transistors</p> <p>n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Physical Mechanism of Current Flow (unbiased).Current gains <math>\alpha</math> and <math>\beta</math> Relations between <math>\alpha</math> and <math>\beta</math>.</p>	8
	PHSACOR10P	<p>7. To add dc voltages using Op-amp in inverting and non-inverting mode.</p> <p>8. a) To investigate the use of an op-amp as an Integrator.</p> <p>9. b) To investigate the use of an op-amp as a Differentiator.</p> <p>10. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.</p> <p>11. To study the various biasing configurations of BJT for normal class A operation.</p> <p>12. To design a Phase Shift Oscillator of given specification using Op-Amp.</p> <p>[After being demonstrated the Experiments are done by the student groups]</p>	10
May 2024	PHSACOR10T	<p>BJT: Load Line analysis of Transistors.</p> <p>Current gains <math>\alpha</math> and <math>\beta</math> Relations between <math>\alpha</math> and <math>\beta</math>. Load Line analysis of Transistors.</p> <p>FET: Basic principle of operation of JFET, JFET parameters and CS characteristics</p>	8
	PHSACOR10P	<p>13. To design inverting amplifier using Op-amp (741/351) and study its frequency response</p> <p>14. To design non-inverting amplifier using Op-amp (741/351) &amp; study its frequency response</p> <p>15. To study the zero – crossing detector and comparator.</p> <p>16. Using Schmitt trigger and associated circuit (with OPAMP) generate different wave forms.</p> <p>[After being demonstrated the Experiments are done by the student groups]</p>	8+2
within 07.06.2024 June (1 <sup>st</sup> , 2 <sup>nd</sup> week) 2024		Internal Examination & Class for Slow Learners	6
13.07.2024		END SEMESTER EXAMINATION	

<b>Total Classes</b>	<b>62</b>
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**NAME OF TEACHER: MD MOINUL ISLAM**

**PAPER ALLOTTED: PHSACOR09T, PHSACOR09P**

<b>Month</b>	<b>Paper</b>	<b>Topic</b>	<b>No of classes</b>
<b>March 2024</b> 02.03.2024	<b>PHSACOR09T</b>	<b>Nuclear Physics:</b> Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy	<b>6</b>
	<b>PHSACOR09P</b>	4. To determine the wavelength of laser source using diffraction of single slit. 5. To determine the wavelength of laser source using diffraction of double slits. 6. To determine the value of e/m by Bar magnet.	<b>8</b>
<b>April 2024</b>	<b>PHSACOR09T</b>	<b>Nuclear Physics:</b> Nuclear Shell Model and magic numbers. Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino. Problem solving on nuclear physics	<b>10</b>
	<b>PHSACOR09P</b>	4. To determine the Planck's constant using LEDs of at least 4 different colours. 5. To determine angular spread of He-Ne/ solid state laser using plane diffraction grating. 6. To determine the ionization potential of mercury.	<b>8</b>
<b>May 2024</b>	<b>PHSACOR09T</b>	<b>Nuclear Physics:</b> Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Problem solving on nuclear physics.	<b>8</b>
	<b>PHSACOR09P</b>	3. To determine the wavelength of H-alpha emission line of Hydrogen atom. 4. To determine the absorption lines in the rotational spectrum of Iodine vapour.	<b>8</b>
<b>within 07.06.2024</b> <b>June (1<sup>st</sup>, 2<sup>nd</sup> week) 2024</b>		<b>Internal Examination &amp; Class for Slow Learners</b>	<b>6</b>
<b>July 2024</b>	<b>PHSACOR09T</b>	<b>Nuclear Physics:</b> Nuclear reactor: slow neutrons interacting with Uranium 235;	<b>6</b>

		<b>Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions).</b> <b>Problem solving on nuclear physics</b>	
	<b>PHSACOR09P</b>	<b>1. To determine work function of material of filament of directly heated vacuum diode.</b>	<b>4</b>
<b>13.07.2024</b>		<b>END SEMESTER EXAMINATION</b>	
<b>Total Classes</b>			<b>64</b>