Arts, Science and Commerce College, Indapur, Dist. Pune

TEACHING AND EVALUATION PLAN

Name of the teacher Dr. Veer Shivaji Shamrao **Year:** 2021-22 **Semester:** 3

Subject: Physics **Paper PH212: ELECTRONICS** **Class:** S.Y.B.Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Sep	1&2	10	6	**NETWORK THEOREMS** Kirchhoff's laws (revision) Voltage and Current divider circuits Thevenin's theorem Norton's theorem	6	**NETWORK THEOREMS** Kirchhoff's laws (revision) Voltage and Current divider circuits Thevenin's theorem Norton's theorem	Nil	
		3&4	12	6	Super-position theorem Maximum power transfer theorem (All theorems to with proof)Problems. **BIJUNCTION TRANSISTOR** Revision of bipolar junction transistor, types, symbols and basic action. Configurations (Common Base, Common Emitter & Common Collector) . Current gain factors (α &β) and their relations.	6	Super-position theorem Maximum power transfer theorem (All theorems 1.3 to 1.6 with proof) Problems. **BIJUNCTION TRANSISTOR** Revision of bipolar junction transistor, types, symbols and basic action. Configurations (Common Base, Common Emitter & Common Collector) . Current gain factors (α &β) and their relations.	Nil	
		5	4	3	Input, output and transfer characteristics of CE, CB & CCconf Biasing methods: Base bias, Emitter feedback and voltage divider DC load lines (CE), Operating point (Q point) Transistor as a switch Problems igurations.	3	Input, output and transfer characteristics of CE, CB & CCconfiguratio Biasing methods: Base bias, Emitter feedback and voltage divider DC load lines (CE), Operating point (Q point) Transistor as a switch Problems ns	Nil	
2	Oct.	1&2	6	3	**OPERTAIONAL AMPLIFIERS** Introduction Ideal and practical Characteristics Operational amplifier: IC 741- Block diagram and Pin diagram	3	**OPERTAIONAL AMPLIFIERS** Introduction Ideal and practical Characteristics Operational amplifier: IC 741- Block diagram and Pin diagram	Nil	

					Concept of virtual groundInverting and non-inverting operational amplifiers with concept of gain Operational amplifier as an adder and substracter.Problems		Concept of virtual groundInverting and non-inverting operational amplifiers with concept of gain Operational amplifier as an adder and substracter.Problems		
		3&4	12	6	**OSCILLATROS** Concept of positive and negative feedback Barkhausein criteria for an oscillator Construction, working and applications ofPhase shift oscillator using IC-741Problems. **POWER SUPPLY** Concept and working of rectifier half wave, full wave and bridge rectifierRipple voltageRC filter circuit	6	**OSCILLATROS** Concept of positive and negative feedback Barkhausein criteria for an oscillator Construction, working and applications ofPhase shift oscillator using IC-741Problems. **POWER SUPPLY** Concept and working of rectifier half wave, full wave and bridge rectifierRipple voltageRC filter circuit	Nil	
3	Nov.	1&2	10	6	Unregulated and regulated power supplyConcept of load and line regulation Zener as regulator Problems.	6	Unregulated and regulated power supplyConcept of load and line regulation Zener as regulator Problems.	Nil	
		3	6	3	**NUMBER SYSTEM AND LOGIC GATES** Number systems: Binary, Binary coded decimal (BCD), Octal, Hexadecimal Addition and subtraction of binary numbers and binary fractions using one's and two's complement.	3	**NUMBER SYSTEM AND LOGIC GATES** Number systems: Binary, Binary coded decimal (BCD), Octal, Hexadecimal Addition and subtraction of binary numbers and binary fractions using one's and two's complement.	Nil	
		4&5	9	6	Basic logic gates (OR, AND, NOT) Derived gates: NOR, NAND, EXOR, EXNOR with symbols and truth tables Boolean Algebra De Morgan's theorems and its verification Problems	4	Basic logic gates (OR, AND, NOT) Derived gates: NOR, NAND, EXOR, EXNOR with symbols and truth tables Boolean Algebra De Morgan's theorems and its verification Problems	Nil	

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2 One copy of the plan should be submitted at the beginning of the term after filling up columns 1 to 6.

3 The second copy must be retained by the teacher and submitted at the end of the term. Part second of the plan i. e. columns 7 to 10 must be filled up progressively at the end of every week.

Signature of Teacher

Signature of Head of Department

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TEACHING AND EVALUATION PLAN

Name of the teacher	**Prof.(Dr.) Veer Shivaji Shamrao**	**Year: 2021-22**	**Semester: 1**
Subject: Physics		**Paper: PHCT-113 Electronics**	**Class: M.Sc.**

Part I : Teaching Plan						**Part II : Evaluation of Plan**			
1	2	3	4	5	6	7	8	9	10
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	Sep.	1&2	10	6	**Semiconductor Devices and its Applications** **1.1 SCR:** Construction, working, Characteristics and applications as half wave and full wave rectifier **1.2 DIAC and TRIAC:** Construction, working, characteristics and applications as fan regulator	6	**Semiconductor Devices and its Applications** **1.1 SCR:** Construction, working, Characteristics and applications as half wave and full wave rectifier **1.2 DIAC and TRIAC:** Construction, working, characteristics and applications as fan regulator	Nil	
		3&4	12	6	**1.3 DC-DC converter and SMPS:** Concept and applications **Operational Amplifier** Function generator using two OPAMPS with variable controls,Astable and Monostable multivibrators using OPAMPs, Precision rectifiers, Instrumentation amplifier **2.2 Timer IC 555:** Applications as PAM, PWM, FM and FSK generator	6	**1.3 DC-DC converter and SMPS:** Concept and applications **FOperational Amplifier** Function generator using two OPAMPS with variable controls, Astable and Monostable multivibrators using OPAMPs, Precision rectifiers, Instrumentation amplifier **2.2 Timer IC 555:** Applications as PAM, PWM, FM and FSK generator	Nil	
		5	4	2	**2.3 Voltage Controlled Oscillator (IC566):** Block diagram and working	2	**2.3 Voltage Controlled Oscillator (IC566):** Block diagram and working	Nil	
2	Oct.	1&2	6	3	**2.4 Phase Locked Loop (IC565):** Block diagram and working and applications as FM detector, FSK detector, Frequency multiplier and Frequency Translator	3	**2.4 Phase Locked Loop (IC565):** Block diagram and working and applications as FM detector, FSK detector, Frequency multiplier and Frequency Translator	Nil	

		3&4	12	6	**Digital Logic Circuits I: Combinational Logic** Review ofBoolean identities and its use to minimize Boolean expressionsUse of Karanaugh Map to design 4-variable logic circuits like BCD to 7-segment decoder, Binary-to-Gray and Gray-to-Binary code converter. **Digital Logic Circuits II: Sequential Logic** 4-bit serial, parallel and combinational counter.Study of IC 7490 with applications as MODcounters (01 to 99)Study of IC 7495 and its use as SISO, SIPO, PIPO and PISO.UP-DOWN counters, Ring counter and their applications.	6	**Digital Logic Circuits I: Combinational Logic** Review ofBoolean identities and its use to minimize Boolean expressionsUse of Karanaugh Map to design 4-variable logic circuits like BCD to 7-segment decoder, Binary-to-Gray and Gray-to-Binary code converter. **Digital Logic Circuits II: Sequential Logic** 4-bit serial, parallel and combinational counter.Study of IC 7490 with applications as MODcounters (01 to 99)Study of IC 7495 and its use as SISO, SIPO, PIPO and PISO.UP-DOWN counters, Ring counter and their applications.	Nil	
3	**Nov.**	1&2	10	6	**Data Converters Credit-1** **4.1 Digital to Analog converters:** Binary weighted and R-2R ladder type with practical circuit (Using Input switches, Level amplifiers, Control gates and Buffer amplifier)	6	**Data Converters Credit-1** **4.1 Digital to Analog converters:** Binary weighted and R-2R ladder type with practical circuit (Using Input switches, Level amplifiers, Control gates and Buffer amplifier)	Nil	
		3	6	3	Control gates and Buffer amplifier)	3	Control gates and Buffer amplifier)	Nil	
		4&5	9	6	**4.2 Analog to Digital converters:** Single slope, Dual slope, Flash (Simultaneous) type, Counter ramp type, Continuous type and Successive approximation type	6	**4.2 Analog to Digital converters:** Single slope, Dual slope, Flash (Simultaneous) type, Counter ramp type, Continuous type and Successive approximation type	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher	**Mr. Kamble Akin Vasant**	**Year: 2021-22**	**Semester: 5**
Subject: Physics	**Paper: PHY-354: Atomic and Molecular Physics**		**Class: T.Y.B.Sc.**

Part I : Teaching Plan						**Part II : Evaluation of Plan**			
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	Sep.	1&2	9	6	**Atomic structure** Revision of various atomic models Vector atom model (Concepts of space quantization and electron spin) Pauli Exclusion Principle and electron configuration, Quantum states, Spectral notations of quantum states. Problems	6	**Atomic structure** 1. Revision of various atomic models 2. Vector atom model (Concepts of space quantization and electron spin) 3. Pauli Exclusion Principle and electron configuration, Quantum states, Spectral notations of quantum states. Problems	Nil	
		3&4	11	6	**One and Two Valence electron systems** 1. Spin-Orbit Interaction (Single valence electron atom), Energy levels of Na-atom, Selection rules, Spectra of sodium atom, Sodium doublet	6	**One and Two Valence electron systems** 1. Spin-Orbit Interaction (Single valence electron atom), Energy levels of Na-atom, Selection rules, Spectra of sodium atom, Sodium doublet	Nil	
		5	3	2	Spectral terms of two electron atoms, terms for equivalent electrons	2	Spectral terms of two electron atoms, terms for equivalent electrons	Nil	
2	Oct.	1&2	5	3	Singlet-Triplet separations for interaction energy of LS coupling, Lande's interval rule, Spectra of Helium atom. . Problems	3	Singlet-Triplet separations for interaction energy of LS coupling, Lande's interval rule, Spectra of Helium atom. Problems	Nil	
		3&4	12	6	**Zeeman Effect** . Zeeman Effect Experimental arrangement . Normal and anomalous Zeeman Effect	6	**Zeeman Effect** . Zeeman Effect Experimental arrangement . Normal and anomalous Zeeman Effect	Nil	
3	Nov.	1&2	10	6	Stark effect (Qualitative discussion) Applications of Zeeman effects Problems	6	Stark effect (Qualitative discussion) Applications of Zeeman effects Problems	Nil	

		3	6	3	**Molecular spectroscopy** 1. Introduction of molecular spectra and its types 2. Rotational energy levels, Rotational spectra of rigid diatomic molecule 3. Vibrational energy levels 4. Rotational and Vibrational spectra 5. Electronic spectra of molecules 6. Applications of UV-Vis spectroscopy 7. Problems	3	**Molecular spectroscopy** 1. Introduction of molecular spectra and its types 2. Rotational energy levels, Rotational spectra of rigid diatomic molecule 3. Vibrational energy levels 4. Rotational and Vibrational spectra 5. Electronic spectra of molecules 6. Applications of UV-Vis spectroscopy 7. Problems	Nil	
		4&5	9	6	**Raman spectroscopy (6 L)** 1. History of Raman effect, Molecular polarizability 2. Classical theory and Quantum theory of Raman Effect 3. Characteristics Raman Lines and Applications of Raman spectroscopy 4. Problems.	6	**Raman spectroscopy (6 L)** 1. History of Raman effect, Molecular polarizability 2. Classical theory and Quantum theory of Raman Effect 3. Characteristics Raman Lines and Applications of Raman spectroscopy 4. Problems	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher Holkunde Viresh Chandrakant **Year:** 2021-22 **Semester:** 5

Subject: Physics **Paper:** PHY-352: Electrodynamics **Class:** T.Y. B.Sc

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Sep.	1&2	8	6	**Electrostatics** **a.** Revision of Coulomb's law, Gauss law, Electric field, Electrostatic Potential. **b.** Potential energy of system of charges. **c.** Statement of Poisson's and Laplace's equation, Boundary Value problems in electrostatics- Solution of Laplace equation in Cartesian system, Boundary conditions.	6	**Electrostatics** **a.** Revision of Coulomb's law, Gauss law, Electric field, Electrostatic Potential. **b.** Potential energy of system of charges. **c.** Statement of Poisson's and Laplace's equation, Boundary Value problems in electrostatics- Solution of Laplace equation in Cartesian system, Boundary conditions.	Nil	
		3&4	10	6	**d.** Polarization **P**, Electric displacement **D**, Electric susceptibility and dielectric constant, bound volume and surface charge densities. **e.** Electric field at an exterior and interior point of dielectric	6	**d.** Polarization **P**, Electric displacement **D**, Electric susceptibility and dielectric constant, bound volume and surface charge densities. **e.** Electric field at an exterior and interior point of dielectric	Nil	
		5	3	3	**Magnetostatics** a. Concepts of magnetic induction, magnetic flux and magnetic field. b. Magnetic induction due to straight current carrying conductor, magnetization of matter, relationship between **B, H** and **M.**	2	**Magnetostatics** a. Concepts of magnetic induction, magnetic flux and magnetic field. b. Magnetic induction due to straight current carrying conductor, magnetization of matter, relationship between **B, H** and **M.**	Nil	

2	Oct	1&2	1	3	Boundary conditions at the interface of two magnetic media (Normal and tangential components).	3	Boundary conditions at the interface of two magnetic media (Normal and tangential components).	Nil	
		3&4	11	5	Biot-Savart's law, Ampere's force law, Magnetic force between two current carrying loops, Ampere's circuital law. Equation of continuity, Magnetic vector potential **A**, Magnetic susceptibility and permeability	6	Biot-Savart's law, Ampere's force law, Magnetic force between two current carrying loops, Ampere's circuital law. Equation of continuity, Magnetic vector potential **A**, Magnetic susceptibility and permeability	Nil	
3	Nov	1&2	6	6	Day to day applications of Electrodynamics. Concept of electromagnetic induction, Faradays law of induction, Lenz's law, displacement current, generalization of Amperes' law. Maxwell's equations (Differential and Integral form) and their physical significance	6	Day to day applications of Electrodynamics. Concept of electromagnetic induction, Faradays law of induction, Lenz's law, displacement current, generalization of Amperes' law. Maxwell's equations (Differential and Integral form) and their physical significance	Nil	
		3	5	3	Polarization, reflection and refraction of electromagnetic waves through media.	3	Polarization, reflection and refraction of electromagnetic waves through media.	Nil	
		4&5	10	6	Wave equation and plane waves in free space. Poynting theorem and Poynting vector.	6	Wave equation and plane waves in free space. Poynting theorem and Poynting vector.	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher	**Mrs. Raut Swati Amol**	**Year: 2021-22**	**Semester: 5**
Subject:	**Physics**	**Paper: PHY-351: Mathematical Methods in Physics-II**	**Class: T.Y.B.Sc.**

Part I : Teaching Plan						**Part II : Evaluation of Plan**			
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	**Sep.**	1&2	11	6	**Curvilinear Co-ordinates** Review of Cartesian, spherical and cylindrical co-ordinate, transformation equation, General Curvilinear co-ordinate system: Co-ordinate surface, co-ordinate lines, length, surfaces and volume elements in curvilinear co-ordinate system.	6	**Curvilinear Co-ordinates** Review of Cartesian, spherical andcylindrical co-ordinate, transformation equation, General Curvilinear co-ordinate system: Co-ordinate surface, co-ordinate lines, length, surfaces and volume elements in curvilinear co-ordinate system.	Nil	
		3&4	12	6	Orthogonal curvilinear co-ordinate system, expressions for gradient, divergence, Laplacian, and curl, special case for gradient, divergence and curl in Cartesian, spherical polar and cylindrical co-ordinate system, Problems.	6	Orthogonal curvilinear co-ordinate system, expressions for gradient, divergence, Laplacian, and curl, special case for gradient, divergence and curl in Cartesian, spherical polar and cylindrical co-ordinate system, Problems.	Nil	
		5	4	3	**The Special Theory of Relativity** Introduction and applications, Newtonian relativity	2	**The Special Theory of Relativity** Introduction and applications, Newtonian relativity	Nil	
2	**Oct.**	1&2	6	3	Galilean transformation equation, Michelson-Morley experiment, Postulates of special theory of relativity	3	Galilean transformation equation, Michelson-Morley experiment, Postulates of special theory of relativity	Nil	
		3&4	12	6	Lorentz transformations, Kinematic effects of Lorentz transformation, Length contraction, Proper time, Problems	6	Lorentz transformations, Kinematic effects of Lorentz transformation, Length contraction, Proper time, Problems	Nil	
		3	6	3	**Special Functions** Introduction, generating function for Legendre Polynomials: Pn(x), Properties of Legendre.	3	**Special Functions** Introduction, generating function for Legendre Polynomials: Pn(x), Properties of Legendre.	Nil	

		4&5	9	6	Polynomials, Generating function for Hermite Polynomials: Hn(x), Properties of Hermite Polynomials, Bessel function of first kind: Jn (x), Properties of Bessel function of first kind, Applications of Special Functions in Physics, Problems	6	Polynomials, Generating function for Hermite Polynomials: Hn(x), Properties of Hermite Polynomials, Bessel function of first kind: Jn (x), Properties of Bessel function of first kind, Applications of Special Functions in Physics, Problems	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher : Mrs. Raut Swati Amol **Year:** 2021-22 **Semester:** 3

Subject: Physics **Paper:** PHOT234M2: Material Science-I **Class:** M Sc-II

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Sep	1&2	8	7	**Properties of Materials and Defects in Solids** a) Mechanical, electrical, magnetic, thermal and optical properties (in brief – 2L only) b) Point defects - Vacancies, interstitials, non-stoichiometry, substitution, Schottky and Frenkel defects with proofs c) Line defects - Edge and screw dislocations, properties of dislocations – force on dislocation,	8	**Properties of Materials and Defects in Solids** a) Mechanical, electrical, magnetic, thermal and optical properties (in brief – 2L only) b) Point defects - Vacancies, interstitials, non-stoichiometry, substitution, Schottky and Frenkel defects with proofs c) Line defects - Edge and screw dislocations, properties of dislocations – force on dislocation,	Nil	
		3&4	10	8	d) Surface defects – grain boundaries with explanation of high angle, low angle, tilt and twist boundaries, stacking fault e) Volume defect- twin boundary	8	d) Surface defects – grain boundaries with explanation of high angle, low angle, tilt and twist boundaries, stacking fault e) Volume defect- twin boundary	Nil	
		4	3	3	**Expt-1Humidity measurement**	3	**Expt-1** Humidity measurement	NIl	
2	Oct	1	1	1	**Solid Solutions and Diffusion in Solids** a) Solid solubility with few examples, Types of solid solutions Substitutional	1	**Solid Solutions and Diffusion in Solids** a) Solid solubility with few examples, Types of solid solutions Substitutional	Nil	
		2&3	11	8	Interstitial, Factors governing solid solubility (Hume - Rothery rule), Atomic size and size factor in solid solutions, Vegard's law, Explanation of strain in solid solutions b) Mechanism of Diffusion, Fick's first and second laws of diffusion, solution to Fick's second law (without proof, introduction of error function), Factors governing diffusion, Experimental determination of D, Applications of diffusion: Corrosion resistance of duralumin, Carburization of steel, Decarburization of steel, Doping of	8	Interstitial, Factors governing solid solubility (Hume - Rothery rule), Atomic size and size factor in solid solutions, Vegard's law, Explanation of strain in solid solutions b) Mechanism of Diffusion, Fick's first and second laws of diffusion, solution to Fick's second law (without proof, introduction of error function), Factors governing diffusion, Experimental determination of D, Applications of diffusion: Corrosion resistance of duralumin, Carburization of steel, Decarburization of steel, Doping of	Nil	

					semiconductors		semiconductors		
		4	6	4	**Expt-2** To determine specific heat of graphite	4	**Expt-2** To determine specific heat of graphite	Nil	
3	Nov	1	5	4	**Expt-3** Temperature dependent resistivity measurement of a material	4	**Expt-3** Temperature dependent resistivity measurement of a material	Nil	
		2&3	10	8	**Expt-4** To determine the dipole moment of a given liquid **Expt-5** . To determine the magnetic susceptibility of FeCl3	8	**Expt-4** To determine the dipole moment of a given liquid **Expt-5** . To determine the magnetic susceptibility of FeCl3	Nil	
		4&5	9	8	. **Expt-6** Plotting of crystal structures using Software **Expt-7** Density of ceramic material using XRD	8	. **Expt-6** Plotting of crystal structures using Software **Expt-7** Density of ceramic material using XRD	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher Prof.(Dr.) Veer Shivaji Shamrao **Year:** 2021-22 **Semester:** 6

Subject: Physics **Paper:** PHY-365 (A): Electronics-II **Class:** T.Y.B.Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods availabl e	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Jan	1&2	07	4	**Semiconductor Devices:** LED and Photodiode, Optocoupler. (Working Principles) Problems. BJT: Transistor amplifier classifications - Class A, B, C and AB (working only), Differential amplifier (transistorized), Problem	4	**Semiconductor Devices:** a. LED and Photodiode, Optocoupler. (Working Principles) Problems BJT: Transistor amplifier classifications - Class A, B, C and AB (working only), Differential amplifier (transistorized), Problem	Nil	
		3&4	12	6	Field Effect Transistor: JFET (Introduction, classification, principle, working and IVcharacteristics) MOSFETs (DE-MOSFET and E only MOSFET) **Applications of Semiconductor Devices:** Three Pin Regulators: Block diagram of 3-pin ICregulator, study of IC-78XX, 79XX. Dual Power Supply using IC-78XX, 79XX. Ref. Switching Regulators (SMPS): Introduction, Block diagram, Advantages and Disadvantages.	6	Field Effect Transistor: JFET (Introduction, classification, principle, working and IV characteristics) MOSFETs (DE-MOSFET and E only MOSFET). Problems. Ref. 1 **Applications of Semiconductor Devices:** Three Pin Regulators: Block diagram of 3-pin IC regulator, study of IC-78XX, 79XX. Dual Power Supply using IC-78XX, 79XX. Switching Regulators (SMPS): Introduction, Block diagram, Advantages and Disadvantages.	Nil	
		5	5	3	Modulation and Demodulation : Concept of Carrier Wave, Need of Modulation and Demodulation, Methods of Modulation like AM, FM, PM (Concepts Only), d. Concept of Modulation Index, Upper and Lower Side Band Frequencies in AM. Problems,	3	c. Modulation and Demodulation : Concept of Carrier Wave, Need of Modulation and Demodulation, Methods of Modulation like AM, FM, PM (Concepts Only), d. Concept of Modulation Index, Upper and Lower Side Band Frequencies in AM. Problems, Ref.3	Nil	

2	**Feb**	1&2	11	6	**Integrated Circuits:** a. Integrated Circuits: Introduction, Scale of Integration, Advantages and drawbacks of IC Ref.4 OP-AMP Applications as Integrator, Differentiator, Comparator.	6	**Integrated Circuits:** a. Integrated Circuits: Introduction, Scale of Integration, Advantages and drawbacks of IC OP-AMP Applications as Integrator, Differentiator, Comparator.	Nil	
		3&4	11	6	Timer IC-555: Block diagram, Astable, monostable multivibrator (working and design). Problems	6	Timer IC-555: Block diagram, Astable, monostable multivibrator (working and design). Problems	Nil	
3	**March**	1&2	10	5	**Combinational and Sequential Circuits:** Combinational Circuits: Introduction to SOP and POS equation. Concept of Standard SOP and POS equation. Concept of K-map and their use in reduction of Boolean expressions, design of half adder,	5	**Combinational and Sequential Circuits:** Combinational Circuits: Introduction to SOP and POS equation. Concept of Standard SOP and POS equation. Concept of K-map and their use in reduction of Boolean expressions, design of half adder	Nil	
		3	5	3	full adder, half subtract, Study of binary to gray and gray to binary code conversion. Problems. Sequential Circuits: RS flip flop using NAND/NOR, clocked RS, D, JK and T-flip flops. Application of flip flops in Sequential Circuits as Counters and Registers	3	full adder, half subtract, Study of binary to gray and gray to binary code conversion. Problems. Sequential Circuits: RS flip flop using NAND/NOR, clocked RS, D, JK and T-flip flops. Application of flip flops in Sequential Circuits as Counters and Registers.	Nil	
		4&5	10	6	Asynchronous and Synchronous Counters. (3-bit Counter), Shift Registers and their types of operation -SISO, SIPO, PISO, PIPO (Concepts only).	6	Asynchronous and Synchronous Counters. (3-bit Counter), Shift Registers and their types of operation -SISO, SIPO, PISO, PIPO (Concepts only).	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher Mr. Kamble Akin Vasant **Year:** 2021-22 **Semester:** 6

Subject: Physics **Paper** PHY-363: Thermodynamics and Statistical Physics **Class:** T.Y.B.Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Jan.	1&2	07	4	**Transport phenomenon and Maxwell's relations:** Mean free path, Transport phenomenon, Viscosity, Thermal conductivity and diffusion.	4	**Transport phenomenon and Maxwell's relations:** Mean free path, Transport phenomenon, Viscosity, Thermal conductivity and diffusion.	Nil	
		3&4	12	6	Thermodynamic functions: Internal Energy, Enthalpy, Helmholtz function, Gibb's function, Derivation of Maxwell Relations, Specific heat and latent heat equations, Joule Thomson effect (Throttling Process), Problems **Elementary Concepts of Statistics:** Probability, distribution functions, Random Walk	6	Thermodynamic functions: Internal Energy, Enthalpy, Helmholtz function, Gibb's function, Derivation of Maxwell Relations, Specific heat and latent heat equations, Joule Thomson effect (Throttling Process), Problems **Elementary Concepts of Statistics:** Probability, distribution functions, Random Walk	Nil	
		5	5	3	Binomial distribution, Simple random walk problem, Calculation of mean values, Probability distribution for large-scale N,	3	Binomial distribution, Simple random walk problem, Calculation of mean values, Probability distribution for large-scale N,	Nil	
2	Feb.	1&2	11	6	Gaussian probability distributions, Problems **Statistical Distribution of System of Particles and Ensembles:** Specification of state of system, Statistical ensembles	6	Gaussian probability distributions, Problems **Statistical Distribution of System of Particles and Ensembles:** Specification of state of system, Statistical ensembles	Nil	
		3&4	11	6	Basic Postulates, Probability calculations, Behaviors of density of states, Thermal, Mechanical and general interactions	6	Basic Postulates, Probability calculations, Behaviors of density of states, Thermal, Mechanical and general interactions	Nil	

3	**March**	1&2	10	5	Micro canonical Ensemble (Isolated System), Canonical ensembles, simple application of canonical ensemble, Molecules in Ideal gas, Calculation of mean values in canonical ensemble. Problems.	5	Micro canonical Ensemble (Isolated System), Canonical ensembles, simple application of canonical ensemble, Molecules in Ideal gas, Calculation of mean values in canonical ensemble. Problems.	*Nil*	
		3	5	3	**Introduction to Quantum Statistics**: Quantum distribution function, Maxwell-Boltzmann's statistics, Bose-Einstein Statistics, Fermi-Dirac Statistics	3	**Introduction to Quantum Statistics**: Quantum distribution function, Maxwell-Boltzmann's statistics, Bose-Einstein Statistics, Fermi-Dirac Statistics	*Nil*	
		4&5	10	6	Comparison of the distributions. Applications of Quantum Statistics, Problems	6	Comparison of the distributions. Applications of Quantum Statistics, Problems	*Nil*	

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TEACHING AND EVALUATION PLAN

Name of the teacher	**Mr. Holkunde Viresh Chandrakant**		
Subject:	**Physics**	**Year:** 2021-22	**Semester:** 6
	Paper PHY-366 Elective-II (R): Lasers		**Class:** T.Y.B.Sc.

Part I : Teaching Plan						**Part II : Evaluation of Plan**			
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	**Jan**	1&2	07	4	**Introduction to Lasers:** Brief history of Lasers, Interaction of radiation with matter, Energy levels, Population density,	4	**Introduction to Lasers:** Brief history of Lasers, Interaction of radiation with matter, Energy levels, Population density,	Nil	
		3&4	12	6	Boltzmann distribution, Stimulated Absorption, Spontaneous Emission and Stimulated Emission, Einstein's Coefficients, Einstein's relations. Characteristics of Laser: Directionality, Mono-chromaticity, Coherence	6	Boltzmann distribution, Stimulated Absorption, Spontaneous Emission and Stimulated Emission, Einstein's Coefficients, Einstein's relations. Characteristics of Laser: Directionality, Mono-chromaticity, Coherence	Nil	
		5	5	3	**Laser Action:** Population inversion, Condition for light amplification, Gain coefficient, Active medium, metastable states. Pumping schemes: three level and four level	3	**Laser Action:** Population inversion, Condition for light amplification, Gain coefficient, Active medium, metastable states. Pumping schemes: three level and four level	Nil	
2	**Feb**	1&2	11	6	**Laser Oscillator:** Optical feedback, round trip gain, critical population inversion,Optical	6	**Laser Oscillator:** Optical feedback, round trip gain, critical population inversion,Optical resonator, condition	Nil	

					resonator, condition for steady state oscillations, cavity resonance frequencies.		for steady state oscillations, cavity resonance frequencies.		
		3&4	11	6	**Laser Output:** Line-shape broadening: Lifetime broadening, Collision broadening	6	**Laser Output:** Line-shape broadening: Lifetime broadening, Collision broadening	Nil	
3	**March**	1&2	10	5	**Types of Lasers:**Solid State Lasers Ruby Laser, Diode Laser, Gas Lasers – HeNe Laser, CO_2 Laser	5	**Types of Lasers:**Solid State Lasers Ruby Laser, Diode Laser, Gas Lasers – HeNe Laser, CO_2 Laser	Nil	
		3	5	3	**Applications of Lasers:** Industrial: welding, cutting, drilling	3	**Applications of Lasers:** Industrial: welding, cutting, drilling	Nil	
		4&5	10	6	Nuclear Science: laser isotope separation, laser fusion, Medical: eye surgery	6	Nuclear Science: laser isotope separation, laser fusion, Medical: eye surgery	Nil	

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