SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS), COIMBATORE - 641 020

Name of the Programme: B.Sc Physics

Month & Year of Revision: Feb-2021

S.No.	Course Title	Course Code	% of Revision
1	Properties of matter and sound	20UPH1C01	23
2	Electricity and Magnetism	20UPH2C03	20
3	Analog and Digital Circuits	20UPH3C05	31
4	Heat, Thermodynamics and Statistical Mechanics	20UPH4C06	23
5	Mathematical Physics and Classical Mechanics	20UPH5C07	21
6	Optics	20UPH5C08	45
7	Atomic Physics and Spectroscopy	20UPH5C09	21
8	Microprocessor and its Physics Applications	20UPH5C10	32
9	Alternate Energy Resources	20UPH6EL1	86
10	Relativity, Wave Mechanics and Space Physics	20UPH6C11	28
11	Solid State Physics	20UPH6C12	20
12	Nuclear Physics	20UPH6C13	22
13	Programming in C and its Physics Applications	20UPH6C14	22
14	Allied Theory Physics - I	20UPH3AL3	47
15	Allied Theory Physics - II	20UPH4AL4	82
16	Working model	20UPH5CP5	100
17	project	20UPH6CPR	100
18	kinematics	20UPH1C02	100
19	Fluid dynamics	20UPH2C04	100

Note:

No.of Courses offered by the Department (A)

No.of Courses revised in BoS (20% Revision) (B)	19
Formula for Syllabus revision: (B/A)*100	67.857

Details of Syllabus revision for the academic year 2020-21

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	Newton's law of gravitation from Kepler's laws – Determination of 'G' by Boy's method – Poynting's method – Variation of 'g' with altitude, depth and latitude – Gravitational potential and field – solid, hollow spheres and Spherical shell.	Newton's law of gravitation- Kepler's laws – Deduction of Newton's law of gravitation from Kepler's law. Determination of 'G' by Boy's method - Poynting's method - Gravitational field and Gravitational potential – *Determination of gravitational potential and field due to a solid sphere-Determination of 'g' by compound pendulum and Kater's pendulum.	Added	2

Name of the Course: UG – Properties of matter and sound (20UPH1C01)

Π	Relation between module of elasticity and Poisson's ratio – Work done in stretching and twisting – Twisting couple of a cylinder – Rigidity modulus – Static torsion and Torsional oscillations –uniform and non-uniform bending - Bending moment - 'q' by Koenig's method – Cantilever oscillations.	Relation between the elastic moduli - Poisson's ratio – Determination of Poisson's ratio for rubber – Torsion of a cylinder- Expression for torque per unit twist – Determination of Rigidity modulus – Static torsion method- Dynamic torsion method- Dynamic torsion method- Work done in twisting a couple – Torsional oscillations of a body - Bending of Beam-Expression for the bending moment – *Measurement of Young's modulus- Non- uniform and Uniform bending.	Added	2
III	Molecular theory – Relation between curvature, pressure and surface tension – Applications to cylindrical, spherical drops and bubbles – Surface tension by Quincke's method, Jacgor's method and Ripple method – Variation of surface tension with temperature. Poiseuille's formula – Viscosity by capillary flow method – Motion through highly viscous liquids-Stoke's formula – Viscosity of gases – Rankine'smethod.	"Surface tension and surface energy- Pressure difference across a liquid surface-Excess pressure inside a Liquid drop- Soap bubble – Curved liquid surface – Application s to cylindrical, spherical drops and bubbles - Determination of surface tension by drop weight method- Coefficient of Viscosoty – Poiseuille's formula for rate of flow of liquid in a capillary tube-Poiseuille method for determination of coefficient of viscosity of a liquid- *Terminal Viscosity and Stoke's formula for the coefficient of viscosity of viscous liquid.	Replaced	5

IV	Laws of transverse vibration of strings - Velocity of transverse waves along a stretched string –Melde's experiment –Closed end organ pipe – Open end organ pipe. Classification of sound – Intensity of sound – Measurement of intensity of sound - Doppler effect – Microphones and loud speakers –Wave front at supersonic speed.	Classification of Sound- Intensity of sound - Measurement of intensity of sound - * Doppler effect - wave front at supersonic speed - SHM and harmonic oscillator- Energy of a harmonic oscillator –Free, Damped and Forced vibrations – free vibrations of a body- equations of damped harmonic oscillations – Equations of Forced oscillations – Resonance,	Replaced	14
			Total	23

Name of the Course: UG – Electricity and Magnetism (20UPH2C03)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	Electrical measurements: Potential difference – Electric current – Ohm's law – Resistance – Resistances in series and parallel – Kirchhoff's laws - Ammeters and voltmeters. R, C, L, RC, RL and RLC Circuits in AC and DC	DC Circuits containing L and R, C and R, L,C and R & AC circuit containing C, L, R and R, C and R, L, C - R L C in series and parallel - Phenomenon of Resonance - Series and parallel resonance circuit and Q factor. NETWORK THEOREMS: Thevenin theorem - Norton theorem - Superposition theorem - Maximum Power Transfer theorem - *FILTER CIRCUITS: Low pass, High pass, Band pass circuits.	Replaced	20
			Total	20

Name of the Course: UG – Analogue and digital circuits (20UPH3C05)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
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Ι	Energy band in solids – types of semiconductor – majority and minority carriers – Mobile charge carriers and immobile ions – drift current in intrinsic semiconductor – PN junction – Depletion layer – barrier voltage – Effect of temperature – forward biased and reverse biased pn junction – Zener breakdown – Avalanche breakdown – H parameters in CE and CB configuration.	Energy band in solids - types of semiconductor - majority and minority carriers - Mobile charge carriers and immobile ions - drift current in intrinsic semiconductor - PN junction - Depletion layer - barrier voltage - Effect of temperature - forward biased and reverse biased pn junction - Zener breakdown - Avalanche breakdown - Tunnel diode - Varactor diode - PIN diode - LED - Diode characteristics	Added	2
Π	Single stage Transistor amplifiers – CB,CE and CC – comparison of amplifier configuration – Amplifier classification based on the biasing condition – Class B push- pull amplifier – Complementary Symmetry push-pull class B amplifier – Distortion in amplifiers – RC and Transformer coupled two stage amplifiers – Direct-couple amplifier using complementary and symmetry of two transistors – Darlington pair	Amplifiers:Transformer coupled Class A amplifier-Class Bpush-pull amplifieramplifier-RCand ImpedanceImpedancecoupled two stageamplifiers-Distortion in amplifiers-Distortion in amplifiers-Hparameters in CE and CB configurationOscillators:Comparison between an amplifier and oscillatorDistortionDamped and undamped OscillationsTunedbase oscillator*Tunedcollector oscillatoroscillator-Hartleyand*Wienbridge oscillatorCrystalcontrolled OscillatorOscillator-Astable, *Monostableand Bistablemultivibrator.	Added	2
III	Rectifiers – Half wave - full wave rectifiers – voltage regulation using Zener diode and transistor- Characteristics of ideal and practical operational amplifiers –Inverting and Non-inverting amplifier – Adder – Subtractor – Integrator – Differentiator –	Rectifiers – Half wave - full wave rectifiers – Ripple factor - Voltage regulation using Zener diode – Limiters, Clippers, Clampers - Characteristics of ideal and practical operational amplifiers – Unity gain follower – Parameters of OP-AMP -	Added &Replaced	5

	Comparator.	Adder – Subtractor - Integrator – Differentiator – Comparator - Low pass, High pass and Band pass filter Circuits		
IV	Comparison between an amplifier and oscillator – Damped and undamped Oscillations – Tuned base oscillator – Tuned collector oscillator - Hartley and Colpitt's oscillator Phase shift oscillator and Crystal controlled oscillator – Astable and Bistablemultivibrator	Difference between Analog and Digital circuits - Decimal, Binary, Octal and Hexadecimal number system - Conversions between them – Advantages of Octal and Hexadecimal number system - Binary addition, subtraction and multiplication – 1s and 2s complements – BCD – Signed and Unsigned numbers - Weighted and non-weighted codes – ASCII code – Gray to Binary and Binary to Gray conversion	Replaced	20
V	Basic logic gates – Demorgan's theorem – NAND and NOR as a universal gates – Half adder – Full adder - Half subtractor – Full subtractor – 4 Bit binary adder – RS flip flop- J-K flip flop – Digital to Analog Converter (R-2R ladder D/A converter) – Analog to Digital converter (Counter type A/D converter).	Boolean laws – Associative and distributive properties – Basic and Derived logic gates (AND, OR, NOT, XOR, NAND, NOR and XNOR) – <i>Demorgan's</i> <i>theorem</i> – NAND and NOR as a universal gates – Half adder – Full adder – Half subtractor – Full subtractor – Four Bit binary adder - RS and J-K flip flops – R-2R ladder Digital to Analog Converter – Counter type Analog to Digital converter	Added	2
			Total	31

Name of the Course: UG – Heat, Thermodynamics and Statistical Mechanics (20UPH4C06)

Unit	Existing Contont	Povisod Contont	Mode of	% of rovision
Unit	Existing Content	Keviseu Content	revision	70 OI TEVISIOII

			(Added/Repl	
			aced/Deleted)	
Ι	Concept of heat and temperature- Centigrade and Fahrenheit Scales-Types of thermometer-Platinum resistance thermometer-Expansion of solids- Coefficient of liner expansion -Coefficient of superficial expansion-relation between α and β -Expansion of liquids - Relation between Coefficient of apparent and real expansion.	Postulates of kinetic theory of gases - Expression for the pressure exerted by gas - rms speed - kinetic energy per unit volume of a gas - Derivation of gas equation and gas laws - Graham's law of diffusion of gases. *Molecular Collision - Sphere of influence - Clausius' expression for mean free path - Transport phenomena - Viscosity: transport of momentum - Thermal conductivity: transport of thermal energy - Diffusion: transport of mass.	Replaced	20
П	Coefficient of thermal conductivity- Forbe's method -Lee's method for bad conductors - Radial flow of heat -Widemann Franz's law -Stefan's law and verification -Newton's law of cooling -Wein's law Rayleigh jeans law and Planck's law -Solar constant -Surface temperature of sun - Angstrom's Pyroheliometer.	Coefficient of thermal conductivity- Forbe's method -Lee's method for bad conductors –Thermal conductivity of Rubber- Radialflow of heat – Cylindrical flow of heat- Widemann Franz's law – Stefan's law and verificationWein's law Rayleigh jeans law and Planck's law - *Solar constant -Surface temperature of sun – Angstrom's Pyroheliometer.	Added	2
III	Porous plug experiment and its results - Joule Kelvin effect -Temperature of inversion -Liquefaction of air, Liquefaction of hydrogen, Liquefaction of helium -Adiabatic demagnetization – Electrolux Refrigerator.	Porous plug experiment - Theory of Porous plug experiment and its results - Joule Kelvin effect - Temperature of inversion – Relation between Boyle temperature, temperature of inversion and critical temperature - Liquefaction of air- Linde's process - *Liquefaction of hydrogen, Liquefaction of helium- K.Onnes method -	Added	1

	Helium I and II- *Adiabatic demagnetization		
		Total	23

Name of the Course: UG – Mathematical Physics and Classical Mechanics (20UPH5C07)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
П	Curvilinear coordinates – transformation of coordinates – orthogonal curvilinear coordinates – unit vectors in curvilinear systems – cylindrical coordinates – spherical polar coordinates – curl, divergence and gradient in curvilinear, cylindrical and spherical polar coordinates.	Orthogonal curvilinear coordinates - Cylindrical coordinates - Spherical polar coordinates - Curl, Divergence and Gradient in terms of curvilinear, cylindrical and spherical polar coordinates. Laplace transforms: Definition - important formulae - properties of Laplace transforms - Laplace transform of the derivative of a function f(t)	Added	10
III	Special types of matrices - Properties of unitary and orthogonal matrices -Eigen values and Eigen functions- Cayley - Hamilton theorem- Diagonalisation of matrix - Solution of quadratic equations by matrix method.	Special types of matrices - Properties of unitary and orthogonal matrices - Eigen values and Eigen functions- Cayley - Hamilton theorem- Diagonalisation of matrix – Hermitian matrix – Skew Hermitian matrix - Non-symmetric matrix with Non-repeated Eigen	Added	10

V	Conservation theorem – linear and angular momentum - energy – Degress of freedom – constraints – Generalized co-ordinates – transformation equations – Generalized displacement, velocity, acceleration, momentum and force – Principle of virtual work – D' Alembert's principle – Lagrange's equation of motion – linear Harmonic Oscillator, Simple Pendulum and Compound Pendulum.	values – Repeated Eigen values – Symmetric matrices with Non- repeated Eigen Values – Repeated values. Conservation theorem for linear and angular momentum and energy – <i>Degrees of freedom –</i> <i>Constraints</i> – Generalized displacement, velocity, acceleration, momentum – Principle of virtual work – D' Alembert's principle – Lagrange's equation of motion – Application of Lagrange's equation of motion to linear Harmonic Oscillator, Simple Pendulum Compound Pendulum, The Atwood's machine, LCR circuit.	Added	1
			Total	21

Name of the Course: UG – Optics (20UPH5C08)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
	OPTICAL	<mark>Newton's corpuscular</mark>		
	INSTRUMENTS	<mark>theory - reflection of</mark>		
	Aberrations: – Lens	light on corpuscular		
	aberrations – pherical	<mark>theory - refraction of</mark>		
	aberrations – reducing	<mark>light on corpuscular</mark>		
	spherical aberrations –	<mark>theory - origin of wave</mark>		
	comma – astigmatism –	<mark>theory - reflection of a</mark>		
Ι	distortion – chromatic	<mark>spherical wavefront at a</mark>	Added	20
	aberration – chromatic	plane surface - reflection		
	lens- telephotolens-	of a spherical wavefront		
	microscope – simple	<mark>at a spherical surface -</mark>		
	microscope-compound	Refraction of a spherical		
	microscope- Telescope:	<mark>wavefront at a plane</mark>		
	angular magnification of	<mark>surface - refraction of a</mark>		
	telescope- Refracting	<mark>spherical wavefront at a</mark>		

	Astronomical - Reflecting Astronomical - Reflecting telescopes - Eye pieces: Huygens and Ramsden – comparison – Velocity of light: Michelson's rotating mirror method - Houston's method.	spherical surface. Velocity of light: Foucault's rotating mirror method - Michelson's modification of Foucault's method - Rotating mirror null method - Kerr cell method - Houston's method - *Refraction through a convex and concave lenses.		
П	INTERFERENCE Young's experiment- Coherent sources – phase difference and path difference theory of interference fringes- Fresnel's Biprism – Lloyd's single mirror- Billet's split lens- Interference in thin films- interference due to reflected light- Colours of Thin Film - Newton's rings - Determination of the wavelength of the sodium light - Refractive index of a liquid - Newton's rings with white Light – Haidinger's fringes- Michelson Interferometer– visibility of fringes- applications- determination of the refractive index of gases – Jamin'sRefractometer – Mach- Zehnderrefractometer – Rayleigh's Refractometer – FabryPerot Interferometer.	Coherent sources – phase difference and path difference theory ofinterference fringes- Fresnel's Biprism – Lloyd's single mirror- Billet's split lens- Newton's rings – Determination of the wavelength of the sodium light - Refractive index ofa liquid - Newton's rings with white Light – Haidinger's fringes – MichelsonInterferometer– visibility of fringes- applications- Determination of the difference in wavelength between two neighbouring spectral lines – Determination of the refractive index of thin transparent plates – Determination of the refractive index of gases – Jamin'sRefractometer – Mach– Zehnderrefractometer – Rayleigh's Refractometer – Interferometer Holography- Temporal coherence	Added	8

III	DIFFRACTION Fresnel assumptions - Rectilinear propagation of light - Zone plate - action of zone platefor an incident spherical wave front – difference between a zone plate and a convex lens- Fresnel and Fraunhofer Diffraction –diffraction at a circular aperature- diffraction at an opaque circular disc Fresnel Diffraction at a Straight edge- intensity at a point inside thegeometrical shadow (straight edge) - Fresnel Diffraction at a narrow slit and Narrow wire-Fraunhofer Diffraction at a Single slit and Double slit - Plane Transmission grating - Dispersive power of grating.	Fresnel assumptions - Rectilinear propagation of light - Zone plate -action of zone platefor an incident spherical wave front –difference between a zone plate and a convex lens-Fresnel and Fraunhofer Diffraction – diffraction at a circular aperature- diffraction at anopaque circular disc Fresnel Diffraction at a Straight edge- intensity at a point inside the geometrical shadow (straight edge) - Fresnel Diffraction at a narrow slit and Narrow wire- Fraunhofer Diffraction at a Double slit –Dispersive power of grating- concave reflecting grating- Echelon grating	Added	5
IV	POLARISATION Polarization of transverse waves –plane of polarization- Brewster's law- polarization byrefraction - Double refraction - Nicol prism – Nicol prism as an analyser- Huygen's theoryfor uniaxial crystals - Quarter wave plate and half wave plate - Production and Detectionof Plane, Circularly and Elliptically Polarized light - Babinet's compensator – Dichroism- Optical activity - Fresnel's Explanation of optical rotation – Experimental verification -Specific rotation: Laurent's half shade polarimeter.	Polarization of transverse waves —plane of polarization- Brewster's law- Huygen's theoryfor uniaxial crystals-Optic axis in the plane of incidence and inclined to the crystal surface - Optic axis in the plane of incidence and parallel to the crystal surface - Optic axis in the plane of incidence and parallel to the crystal surface - Optic axis in the plane of incidence and perpendicular to the crystal surface- Quarter wave plate and half wave plate - Production and Detectionof Plane, Circularly and Elliptically Polarized light - Babinet's compensator – Dichroism- Fresnel's Rhomb- Optical activity - Fresnel's Explanation of optical rotation — Experimental	Added	6

		verification - Specific rotation: Laurent's half shade polarimeter- LippichPolarimeter- *Huygen's theory for uniaxial crystals		
V	POLARISATION Polarization of transverse waves –plane of polarization- Brewster's law- polarization byrefraction -Double refraction - Nicol prism – Nicol prism as an analyser- Huygen's theoryfor uniaxial crystals - Quarter wave plate and half wave plate - Production and Detectionof Plane, Circularly and Elliptically Polarized light - Babinet's compensator – Dichroism- Optical activity - Fresnel's Explanation of optical rotation – Experimental verification -Specific rotation: Laurent's half shade polarimeter.	Polarization of transverse waves —plane of polarization- Brewster's law- Huygen's theoryfor uniaxial crystals-Optic axis in the plane of incidence and inclined to the crystal surface - Optic axis in the plane of incidence and parallel to the crystal surface - Optic axis in the plane of incidence and parallel to the crystal surface - Optic axis in the plane of incidence and perpendicular to the crystal surface- Quarter wave plate and half wave plate - Production and Detectionof Plane, Circularly and Elliptically Polarized light - Babinet's compensator – Dichroism- Fresnel's Rhomb- Optical activity - Fresnel's Explanation of optical rotation – Experimental verification - Specific rotation: Laurent's half shade polarimeter- LippichPolarimeter- *Huygen's theory for uniaxial crystals	Added	6
			Total	45

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
П	Sommerfeld's relativistic atom model – The Vector atom model – Quantum numbers associated with the vector atom model – Coupling schemes – L-S coupling –J J coupling – The Pauli's exclusion principle – magnetic dipole moment – The stern and Gerlach Experiment – Spin orbit coupling.	Sommerfeld's relativistic atom model – The Vector atom model – Quantum numbers associated with the vector atom model – Coupling schemes – Electronic configuration of elements - The Pauli's exclusion principle – magnetic dipole moment due to orbital and spin – The stern and Gerlach Experiment – Spectral terms and notations – selection rules - intensity rule and interval rule – Fine structure of sodium D lines	Added	8
III	Zeeman effect – Larmor's theorem – Paschen back effect – Stark effect – Production of X-rays – Bragg's law – Bragg's X- ray spectrometer – X- ray spectra – Characteristics of X-ray spectra – Mosley's law – Compton effect – Photo electric effect – Experimental investigation – Einstein's Photo electric equation – Photo voltaic cell.	Zeeman effect – Experimental arrangements – Expression for Zeeman shift – Quantum mechanical explanation of normal Zeeman effect - Larmor's theorem – Paschen back effect – Stark effect – Mosley's law and its importance – X-ray spectra – Continuous spectrum – Characteristic spectrum – Characteristic spectrum – Characteristic spectrum – Compton effect – Expression for Compton shift ($d\lambda$) - Photo electric effect – Richardson and Compton experiment – Einstein's Photo electric equation – Millikan's experiment – Photo voltaic cell.	Added	10

Name of the Course: UG – Atomic Physics and Spectroscopy (20UPH5C09)

Molecularspectra:Introduction – Origin ofmolecular spectra – Natureofmolecular spectra – Natureofmolecular spectra –Rotation of linear system –Non rigid rotator -Theoryofthe origin of purerotational spectrum of amolecule – Electronicspectra of molecule.RamanRamaneffect:Experimental study ofRaman effect – Quantumtheory of Raman effect –applications- Laser Ramanspectroscopy - Classicaltheory of Raman effect -vibrational Raman spectraof diatomic molecules.	Molecularspectra:Introduction – Origin ofmolecular spectra – Natureofmolecular spectra –Rotation of linear system –Non rigid rotator -Theoryofthe origin of purerotational spectrum of amolecule – Electronicspectra of molecule.Ramaneffect:Experimental study ofRaman effect – Quantumtheory of Raman effect –Laser Raman spectroscopy- Classical theory ofRaman effect - vibrationalRaman spectra of diatomicmolecules – Purerotational Raman spectra	Added	1
The energy of a diatomic molecule – vibrating diatomic molecule as a harmonic oscillator – spectroscopic techniques – constant deviation spectrograph – recording the spectrum – UV spectroscopy – Quartz spectroscopy – Quartz spectroscopy – absorption spectroscopy – absorption spectroscopy – Double beam IR spectrometer – Raman spectroscopy – Raman spectrometer.	The energy of a diatomic molecule - vibrating diatomic molecule as a harmonic oscillator- spectroscopic techniques – constant deviation spectrograph – recording the spectrum – UV spectroscopy – Quartz spectrograph for near UV region - Littrow spectrograph - Infra red spectroscopy – Wadsworth Prism-Mirror spectrograph - absorption spectroscopy – Double beam IR spectrometer.	Added	2
		Total	21

Name of	the Course:	UG –	Micropro	cessor	and its	Physics	Applica	tions (20UI	PH5C	(10)
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Unit	Existing Contont	Dovised Content	Mode of	% of rovision	
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			(Added/Repl	
			aced/Deleted)	
Ι	Evolution of Microprocessor-First, second, third and fourth generation microprocessors- Microprocessor based systems - Micro, Mini and Large computers - Advantages and disadvantages of microprocessor based system - General description of Intel 8085 - Pin configuration - 8085 Signal description summary - Block diagram of Intel 8085 - Intel 8085 architecture - Introduction to memory – Semiconductor memory - ROM, PROM, EPROM, static RAM, DRAM and NOVRAM	Evolution of Microprocessor-First, second, third and fourth generation microprocessors- Microprocessor based systems - Micro, Mini and Large computers - Advantages and disadvantages of microprocessor based system - General description of Intel 8085 - Pin configuration - 8085 Signal description summary - Intel 8085 architecture - Machin cycles of 8085-T-states- Opcode fetch machine cycleof 8085- Memory read/write Machine cycle of 8085*(self study). Introduction to memory - Semiconductor memory - Semiconductor memory - ROM, PROM, EPROM, static RAM, DRAM and NOVRAM.	Added	4
III	Programme to transfer data between memory and accumulator – 1's and 2's complement of 8 bit data - Programme to add two 8 bit data –Subtract two 8 bit data – Subtract two 8 CD data – Binary to Gray – Gray to Binary conversion. Programme to add two 16 bit data –Subtract two 16 bit data – Add two BCD data – add an array of datas - Programme to sort an array of data in Ascending and Descending order- Programme to multiply two numbers of 8 bit data - Programme to find the square root of a given	Assembler – need for assembler -advantages of assembler -symbols and representation in Flow Charts. Instruction execution and data flow in 8085-Programme to transfer data between memory and accumulator – 1's and 2's complement of 8 bit data - Programme to add two 8 bit data – Subtract two 8 bit data –	Added	8

	binary number – Programme to search a smallest in the given array of data.	Descendingorder- multiplyProgrammetomultiplytwo numbers of 8 bit data- Programmeto data-Programmetosearchasmallest in the given array of data.levelAssemblylevelprogrammingfor Binary to Gray - Gray to Binary conversion-Programme to find the square root of a giventofind the square root of a 		
IV	Interfacing SRAM and EPROM – Memory capacity – Choice of memory IC's and address allocation – Interfacing I/O devices and peripheral IC's — I/O device mapping (simple descriptions) - Needs for interrupts – Types of interrupts – Polling of interrupts – Data transfer schemes – Synchronous data transfer scheme – Asynchronous data transfer scheme – Interrupt driven data transfer scheme - 8259 Programmable interrupt controller – 8255 peripheral interface-8257 DMA controller.	Interfacing SRAM and EPROM – Memory capacity – Choice of memory IC's and address allocation I/O structure of typical microcomputer Interfacing I/O devices and peripheral IC's — I/O device mapping (simple descriptions) -comparision of memory mapping and I/O mapping-DMA datatransfer scheme. Needs for interrupts – Types of interrupts – Types of interrupts – Polling of interrupts – Interrupt driven data transfer scheme - 8259 Programmable interrupt controller – 8255 peripheral interface-Data transfer schemes – Synchronous data transfer scheme – Asynchronous data transfer scheme (self study)	Added	4
	Temperaturecontrolsystem-Motorspeedcontrolsystem -Steppermotorcontrolsystem -Trafficcontrolsystem -Keyboardcontrolsystem.	Temperaturecontrolsystem-motorspeedcontrolsystem -Trafficcontrolsystem -Keyboardinterfacingusingports.Subroutine-Delayroutine-writingpractice	Added	16

	for different delay routine to produce a time delay in 8085 processor based system whose clock frequency is 3 MHz.and 6 MHz.(self study)		
		Total	32

Name of the Course: UG – Alternate Energy Resources (20UPH6EL1)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	INTRODUCTION Introduction – Consumption pattern – Oil shock – Types based on usage –Usage pattern of primary energy sources – Necessity of harnessing alternate energy resources – Energy chain –Energy and its major classifications.	ENERGYANDRADIATIONMEASUREMENTWorld Energy Futures - Energy Sources and their availability - Renewable Energy Sources - Prospects of Renewable energy sources - Solar Constant - Solar Radiation at the Earth's surface - solar radiation Geometry - *Solar radiation measurements - Estimation of average solar radiation - Solar radiation on tilted surface.	Added	20
п	ENERGY CRISIS Salient features and drawbacks of energy sources in practice- Alternate energy sources and their significances- Energy and its influence on environment -Heating values of various fuels – Energy status – Global	HEATTRANSFERPRINCIPLEANDSOLAR COLLECTORSConduction - Convection-Radiation - Reflectivity -TransmissivityTransmittanceAbsorptancePhysical PrinciplesOnversionofSolar	Added	20

	context –Indian context	radiation into Heat - Flat Plate Liquid Collectors - Transmissivity of cover system - Energy Balance Equation and Collector Efficiency - Thermal performance of FPC - Solar Air Heater and their applications - Concentrating Collector - *Performance analysis of a Cylindrical Parabolic Concentrating Collectors.		
III	THERMAL CONVERSION Principles of Solar thermal conversion - Solar collectors - Solar water heater- Solar passive space heating and cooling systems - Solar industrial heating systems - Solar cookers - Solar furnaces- Solar green house - Solar desalination - Solar pumping - Satellite solar power stations	APPLICATIONS OF SOLAR ENERGY Solar Water Heating - Solar Thermal Electric Conversion - Solar Photovoltaics - Types of solar cells - Solar Distillation - Solar Pumping - Solar Furnace - Solar Cooking - Solar Energy Storage Systems - Solar Ponds - *Types of Solar Ponds.	Added	8
IV	BIOMASS ENERGY Introduction - Photosynthesis - Bio-gas generation - Digesters and their design - Some materials for biogas and biomass - Advantages and disadvantages of biological conversion of solar energy applications of biogas.	BIOMASS AND WIND ENERGY Bio Mass conversion Technologies - Bio Gas generation - Factors Affecting Bio – Digestion - Classification of Biogas Plants - Types of Biogas Plants - Materials used for Biogas Generation -Basic principles of wind energy conversion - Basic components of wind energy conversion system - Classification of WEC System - *Wind energy collectors - Performance of wind Machines.	Added	18

V	FUELCELL Introduction to fuel cell – Potential applications – Classifications – Phosphoric acid fuel cell (PAFC) – Alkane fuel cell (AFC) – Fuel cell power plot- Magneto hydro dynamic (MHD) power conversion – Principle MZHD generator – Advantages – Limitations.	ENERGYSTORAGEANDINDIRECTSOURCESOFSOURCESOFSOURCESOFSolarEnergySolarEnergySolarEnergySolarEnergySolarEnergySolarEnergySolarEnergySolarStorageStorage-ChemicalStorage-ChemicalStorage-CeothermalenergyNatureofGeothermalFields-GeothermalSources-MaterialSelectionforGeothermalPower PlantsGeothermalPower Plants-Yolanation-Yolanation-ThermalElectricConversion-		20
			Total	86

Name of the Course: UG – Relativity, Wave Mechanics and Space Physics (20UPH6C11)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	Michelson-Morley Experiment - GallileanTransformationan d Newtonian Relativity - Inadequacy of Gallilean Transformation - Fundamental Postulates of Special Theory of Relativity - Lorentz Transformation Equations - Length Contraction and Time Dilation –Law of Addition of Velocity- Variation of Mass with Velocity -Equivalence of Mass and Energy.	FrameofReferenceinertialandnon-inertialframes-Michelson-MorleyExperiment-GalileanTransformationandNewtonianRelativityNewtonianRelativity-Generaltheoryofrelativity-Predictionsgeneraltheoryofrelativity-PredictionsofSpecialTheoryofSpecialTheoryTransformationEquations-LengthContractionTimeDilation-LawofAdditionofVelocity-	Added	4

		Variation of Mass with Velocity - Equivalence of Mass and Energy.		
IV	Significance of various quantum numbers – n, l, m_1 – Electron probability density – Commutation relations – Position and momentum, H and P, between the components of L, L ² with L _x , L _y and L _z – Ladder operators L ₊ and L. - Particle in a box – Potential step – The barrier penetration problem – Linear harmonic oscillator.	Significance of various quantum numbers – n, l, m_1 – Operators for momentum, kinetic energy and total energy - Orbital angular momentum operator - Commutation relation between position and momentum, H and P, the components of L, L ² with L _x , L _y and L _z – <i>Ladder operators</i> L ₊ and L. Solution of Schrodinger equation for Particle in a box, Rigid rotator, The barrier penetration problem and Linear harmonic oscillator.	Added	4
V	Solar system-Astronomical Instruments-Refracting telescope-Reflecting telescope-Radio telescope measurement of distance- Size-Rotation – Mass of the sun-Surface temperature – Atmosphere -Planets- Asteroids – Comets -Meteorites-Sun - Star- Physical Properties of Stars-Masses of stars- Stellar Evolution-Milky Way Galaxy – Expanding Universe- Big-bang theory.	Sun synchronous orbit – Geo synchronous orbit – Rocket technology in India – Rohini-75 – Launching of Satellites SLV, ASLV and PSLV programmes – <i>Other Satellite launch</i> <i>vehicles</i> – India's achievements in space science INSAT-1A, 1B, 1C and 1D – INSAT – 2 second generation – INSAT 2A, 2B, 2C, 2D and 2E – INTELSAT-1 – INTELSAT-VII – Mars Orbiter Mission (Mangalyaan) – <i>Chandrayaan</i>	Added	20
			Total	28

Name of the Course: UG – Solid State Physics (20UPH6C12)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	Elements of Crystal Structure - X ray Diffraction - Bragg's Law - Miller Indices - Simple Crystal Structures - Calculation of number of atoms per unit cell – Atomic radius – co- ordination number – Packing factor for SC,BCC,FCC and HCP structures – Rotating crystal method - Powder Photograph method – determination of unit cell dimensions. Crystal imperfections: Point defects – line defects – Surface defects – Volume defects.	Lattice – Unit cell – Bravais lattice – Lattice planes - Miller indices - d spacing in cubic lattice - calculation of no of atoms per unit cell - Atomic radius – co-ordination number - packing factor for SC, BCC, FCC and HCP structures – *Diamond and Graphite structures. X-Ray diffraction – Bragg's law – Rotating crystal method – Powder photograph method – crystal imperfection : Point defects – line defects – surface defects – volume defects – *Effects of crystal imperfection.	Added	7
П	Electrical conduction classification of conducting materials – Drude Lorentz theory – Expression for electrical conductivity – Thermal conductivity – Expression for thermal conductivity – Wiedemann – Franz law – electrical resistivity versus temperature- schottky effect- photoelectric effect – photoelectric emission- free electron gas in three dimensions- periodic	Electrical conduction classification of conducting materials – Drude Lorentz theory – Expression for electrical conductivity – Thermal conductivity – Expression for thermal conductivity – Wiedemann – Franz law – electrical resistivity versus temperature- Fermi surface- Fermi distribution function* High resistive materials- High resistive alloys – photoelectric emission-free electron gas in three dimensions- periodic	Added	8

	boundary conditions- The Fermi Energy failure of the free electron model.	boundary conditions- The Fermi Energy failure of the free electron model.		
III	Dielectric polarization - Dielectric constant and displacement vector - Different types of dielectric polarization – Frequency and temperature effects on polarization – Dielectric loss – Dielectric break down – local fields – ClausiusMossotti relation Piezoelectric effect- properties of ferroelectrics.	Dielectric polarization - Dielectric constant and displacement vector - Different types of dielectric polarization – Frequency and temperature effects on polarization – Dielectric loss – local fields – ClausiusMossotti relation Solid insulating materials- liquid insulating materials- gaseous insulating materials- properties of ferroelectrics.	Added	5
			Total	20

Name of the Course: UG – Nuclear Physics (20UPH6C13)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	Radio activity - Fundamental laws of Radio activity - Laws of Radioactive disintegration - Half life - Mean life - Laws of Successive disintegration — Radioactive dating — The age of earth — radioactive series — Alpha emission — properties of alpha particles — alpha spectrum	Radio activity - Fundamental laws of Radio activity - Laws of Radioactive disintegration - Half life - Mean life - Laws of Successive disintegration – Radioactive dating – The age of earth – biological effects of nuclear radiation- radioactive growth and decay-	Added	4

	 Geiger Nuttal law – Beta decay – Properties of Beta decay – Gamma ray spectrum – Determination of the wavelength of gamma rays. 	radioactive series – Alpha emission – properties of alpha particles – alpha spectrum – Geiger Nuttal law – Beta decay – Properties of Beta decay – Gamma ray spectrum – *Determination of the wavelength of gamma rays. v		
П	Linear accelerator (LINAC) – Betatron – Synchroton – Proton Synchroton – Ionization chamber – GM counter – Wilson's cloud chamber – Bubble chamber – Spark chamber – Scintillation counter – Cerenkov counter	WaveObservatorydetector-Proportionalcounter-GMcounter-GMWilson's cloud chamber-Bubble chamber-Bubble chamber-Bubble chamber-Solid state-chamber-Solid state-detector-Laser-InterferometerScintillationcounterCerenkovcounterLinearaccelerator(LINAC)-Cyclotron-Betatron-Synchroton-	Added	4
III	Classification of nuclei - General properties of nucleus – Binding energy – Nuclear stability - Theories of nuclear composition – Nuclear forces - Proton- electron hypothesis – Proton-neutron hypothesis – Models of nuclear structure – The Liquid drop model – The Shell model – The Collective model.	Classification of nuclei - General properties of nucleus – Binding energy – Nuclear stability - Theories of nuclear composition – Nuclear forces -Meson theory of nuclear forces- Proton- electron hypothesis – Proton-neutron hypothesis – Models of nuclear structure – The Liquid drop model – Semi- empirical mass formula- The Shell model – *The Collective model.	Added	4
IV	The Discovery of artificial transmutation – The Q- value equation for a Nuclear reaction – Types of nuclear reactions – Energy balance in nuclear reactions and the Q-value – Threshold energy of an endoergic reaction –	The Discovery of artificial transmutation – The Q- value equation for a Nuclear reaction – Types of nuclear reactions – Energy balance in nuclear reactions and the Q-value – Threshold energy of an endoergic reaction –	Added	8

	Nuclear fission – critical mass – chain reaction – Nuclear fusion – source of stellar energy – Transuranic elements.	Nuclear fission – critical mass – chain reaction – Nuclear fusion – source of stellar energy – Transuranic elements. Nuclear Reactor safety Approach: Defense in depth approach in design- operating license, Regulatory inspection – Radiation dose limits.		
V	Discovery of cosmic rays – latitude effect – Azimuth effect – Altitude effect – Primary and Secondary cosmic rays – cosmic ray showers – Discovery of positron – the mesons – Van allen belts. Elementary Particles: Classification – Particles and anti particles – the fundamental interactions.	Discovery of cosmic rays – latitude effect – Azimuth effect – Altitude effect – Primary and Secondary cosmic rays – cosmic ray showers – Discovery of positron – the mesons – *Van allen belts. Elementary Particles: Classification – Particles and anti particles – the fundamental interactions- the quark model- Conservation laws and symmetry.	Added	2
			Total	22

Name of the Course: UG – Programming in C and its Physics Applications(20UPH6C14)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	History of C language - Basic Structure of C Programming - Character set - Constants - Variables - Data Types - Operators and Expression - Escape Sequence Characters - Library Functions - Input	History of C-language – Basic Structure of C Programming - Character set – Constants - Variables - Data Types - Operators and Expression - Escape Sequence Characters – Library Functions - Input	Added	4

	and Output statements: scanf - printf - getchar - putchar - gets – puts.	and Output statements: scanf - printf - getchar - putchar - gets – puts. Example Programmes: Simple program by using scanf and printf.		
П	Arrays Variables – Assigning Data for Array - One, Two and Multi dimensional Array - Conditional control statement: if, else, nested if, switch case - Looping statement: while, do while, for, nested for- break - continue and Unconditional control statement: goto statement.	Arrays Variables – Assigning Data for Array - One, Two and Multi dimensional Array – Conditional control statement: if, else, nested if, switch case - Looping statement: while, do while, for, nested for- break – continue and Unconditional control statement: goto statement. Function declaration – argument – Call the function – Return statement - Type of functions - Recursive functions - Recursive functions - Recursive functions - Automatic, Static, Register and External storage. Example Programmes: Simple interest calculation, Average of marks and grades, Sum of series.	Added	4
III	Function declaration – argument – Call the function – Return statement - Type of functions - Recursive functions - Passing Array to functions - Automatic, Static, Register and External storage - Defining a structure – Declaring structure variables – Accessing structure members – Structure initialization – Structure within structures – Structures and functions – Unions – Size of structures.	Defining a structure – Declaring structure variables – Accessing structure members – Structure initialization – Copying and comparing structure variables – Operations on individual members – Array of structures – Structure within structures – Structures and functions – Unions – Size of structures. Example Programmes: Largest of 'n' numbers and its position, ascending order, Addition and Subtraction	Added	7

		of 2 matrices, Factorial calculation		
IV	Understanding pointers – Accessing the address of a variable – Declaring pointer variables – Initialization of pointer variables – Accessing a variable through its pointer – Pointer expressions Defining and opening a file – Closing a file – Input/output operation in files – Error handling during I/O operations – Command line arguments.	Understanding pointers – Accessing the address of a variable – Declaring pointer variables – Initialization of pointer variables – Accessing a variable through its pointer – Pointer expressions Defining and opening of a file – Closing a file - Input/output operation in files – Error handling during I/O operations – Random access to files – Command line arguments. Example Programmes: Command line arguments, opening and closing of file, copying the contents of one file to another, merge of two files.	Added	7
			Total	22

Name of the Course: UG – Allied Theory Physics - I (20UPH2C03)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
I	GRAVITATION Determination of 'G' by Boy's method – Potential and field due to a solid sphere – Variation of 'g' due to altitude and depth. ELASTICITY	GRAVITATIONANDELASTICITYKepler's law of planetarymotion-Lawsofgravitation-DeterminationofG' byBoy'smethodPotential	Added	8

	Determination of 'Y' by non uniform bending – Torsional oscillations – use of Torsional Pendulum to determine 'n' and 'I'	sphere - Variation of 'g' due to altitude and depth - Determination of 'g' by compound pendulum- Poisson's ratio - Twisting couple on a cylinder - Bending moment - Determination of 'Young's modulus by non uniform bending - Torsional oscillations - use of Torsional Pendulum to determine 'rigidity modulus' and 'moment of inertia' - *Relation between elastic constants.		
Π	OPTICS Newton's rings – Determination of refractive index of a liquid – Plane diffraction grating – Determination of wavelength – Dispersive power of a grating – Polarization – Production and analysis of elliptically and circularly polarized light.	THERMODYNAMICS *Laws of thermodynamics I and II - Derivation of gas laws - Avagadro's hypothesis - Graham's law of diffusion of gases - degrees of freedom - *viscosity of gases - *thermal conductivity of gases - Joule Thomson effect - Adiabatic demagnetization - Liquefaction of Helium- Black body radiation - Planks radiation law- thermal conductivity- Meissner effect - Properties of Liquid Helium I and II - Super conductivity - Measurement of Radiation from SUN - Pyroheliometer.	Added	10
III	THERMODYNAMICS Joule Thomson effect – Adiabatic demagnetization – Liquefaction of Helium – Meissner effect – Properties of Liquid Helium I and II – Super conductivity. Measurement of Radiation from SUN – Pyroheliometer.	RELATIVITY Theory of relativity:Frame of reference -inertial frames - Galileantransformation equations -Michelson Morleyexperiment - Postulates ofSpecial Theory ofRelativity - Lorentztransformation - Timedilation and length	Added	5

		contraction - Addition of Velocities - Variation of mass with velocity - *Mass Energy relation.		
IV	MAGNETISM AND ELECTRICITY Field along the axis of along solenoid – tangent Galvanometer – Moving coil galvanometer. Self induction – Mutual induction – Alternating current – LR and LCR series, circuits – Impedance and Resonance.	OPTICS Coherent sources - theory of interference fringes - Fresnel Biprism: Experimental arrangement - determination of wavelength of light - interference fringes with white light using a Biprism - Interference due to Reflected light - Lloyd's single-mirror - Determination of refractive index of a liquid - Fresnel and Fraunhofer diffraction - Plane diffraction grating - Determination of wavelength - Dispersive power of a grating - *Plane of Polarization - Double refraction - Production and analysis of elliptically and circularly polarized light - *Optical activity - Half shade polarimeter	Added	16
V	RELATIVITY Michelson Morley experiment – Postulates of Special Theory of Relativity – Lorentz transformation – Time dilation and length contraction – Addition of Velocities – Mass Energy relation.	MAGNETISMANDELECTRICITYAmpere's circuital law -Magnetic flux -Fieldalong the axis of alongsolenoid -tangentGalvanometer -Ballistic galvanometer -Ballistic galvanometer -Current and chargesensitiveness -Vibrationmagnetometers -determination of M and H-Self induction -Mutualinduction -Experimentaldetermination -Alternating current -LRand LCR series, circuits -	Added	8

	Impedance and Resonance - *Quality Factor - *Band Width.		
		Total	47

Name of the Course: UG – Allied Theory Physics - II (20UPH2C03)

Unit	Existing Content	Revised Content	Mode of revision (Added/Repl aced/Deleted)	% of revision
Ι	QUANTUM OPTICS Einstein's photo electric equation – Photo Voltaic Cell – Photomultiplier – Production and properties of X rays – X ray spectrum –Mosley's law – Compton effect – Derivation of formula for 'd'.	ATOMIC STRUCTUREThomson's plum puddingmodel -Rutherford'sexperiment on α-particlescattering -Rutherford'snuclear atomic model:Distance of closestapproach -majordeficiencies inRutherford's nuclearmodel -Bohr's atomicmodel:Calculationsconcerning Bohr's atomicmodel -spectral series ofhydrogen atom -deficiencies in Bohr'stheory -Sommerfeld'srelativistic model -*Pauli's exclusionprinciple.	Added	20
п	LASER PHYSICS Population Inversion – Methods of producing population inversion – Ruby Laser – Helium- Neon Laser – CO laser, Semiconductor laser - Uses of Lasers.	ATOMIC NUCLEUS Theories of nuclear composition: Proton- neutron theory of nuclear composition - general properties of a nucleus - *Packing fraction - mass defect and atomic binding	Added	20

		- accurate expression for mass defect - variation of binding energy - significance of average binding energy - nuclear forces - meson theory of nuclear forces - Nuclear models: Liquid-drop model - nuclear shell model.		
III	QUANTUM MECHANICS Principle Uncertainty – wave function – Probability Density – Schrodinger's one dimensional equation – Eigen function and Eigen values – Particle in a box – One dimensional Potential well	QUANTUM PHYSICS Waves and particle duality of matter: De Broglie's matter waves - De Broglie's electron waves - Properties of matter waves - Particle nature of X-rays - Experimental study of matter waves - The Davisson-Germer experiment - *Electron microscope - Heisenberg's principle of indeterminacy - Physical significance of wave function – Eigen values and Eigen functions - Time independent Schrödinger equation - Rigid rotator	Added	20
IV	SEMICONDUCTOR PHYSICS PN Junction– Zener Diode – VI Characteristics – Action of a transistor – Transistor characteristics (Common Base and Common Emitter) – Transistor as an Amplifier – Switching action of a Transistor	TRANSISTORS Transistor action: Transistor connections: Common base connection - Characteristics of common base connection - Common emitter connection - Measurement of leakage current - Characteristics of common emitter connection - Common collector connection *Comparison of transistor connections - Transistor circuit as an amplifier (CE arrangement) - RC and Transformer Coupled two stage amplifier.	Added	10

v	INTEGRATED ELECTRONICS Operational Amplifier – Block diagram – Operation Amplifier as an Adder and Subtractor - Integrator and Differentiator. OR, AND & NOT gates – Demorgan's theorems – NAND gate as a universal gate.	LOGIC GATES Definitions for digital signals: Digital waveforms - digital logic - The basic gates: NOT, OR and AND gates - Universal logic gates: NOR and NAND gates - AND-OR-INVERT gates - Positive and negative logic - Boolean laws and theorems: Sum-of-products method - truth table to Karnaugh map- pairs, quads and octets - Karnaugh simplifications - *don't-care conditions - product-of-sums method - product-of-sums simplification.	Added	12
			Total	82

Chairman Board of Studies

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