DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2018-19

Department: **Physics** Paper: **I A** (MECHANICS) Class: **I B.Sc** Semester: **I**

Topics
Vector analysis: scalar and vector fields, gradient of scalar fields & its physical significance.
Divergence & curl of a vector field and related problems, Vector integration. line surface & volume integrals
Stokes, gauss &greens theorems. simple applications, Mechanics of particles: laws of motion,
motion of variable mass system- rocket, multi stage rocket, Conservation of energy & momentum,
collisions in 2&3 Dimensions, Concept of impact parameter, scattering cross section & Rutherford's scattering.
Def of rigid body, rotational kinematics, equation of motion for a rotating body, combined translational and rotational motion,
Angular momentum, inertia tensor Euler equations, precession of top, Gyroscope, precession of equinoxes rotating frames of reference.
Coriolis force, effects elastic constants of isotropic solids & their relations, Poissons ratio and expressions for σ in terms of Y,n,k., Classification of beams, Types of bending,
Point load, distributed load, shearing force & bending moment Sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with end load.
Central forces: def, examples, Conservative nature of Central forces. Central forces as a negative gradient of P.E,
Equation of motion under Central forces. Gravitational potential and field and their relation,
Motion under inverse square law, derivation of Kepler's laws. Satellite motion, Newton's laws from Kepler's laws,
Special theory of relativity: Galilean relativity, absolute frames, Michelson-Morley expt, postulates of relativity, Lorentz transformations, time dilation, length contraction,
variation of mass with velocity, mass energy relation, Momentum and energy relation, Addition of velocities, Concept of four vector formalism,

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: **Physics** Paper: **I A** (MECHANICS) Class: **I B.Sc** Semester: **I**

Topics
Vector analysis: scalar and vector fields, gradient of scalar fields & its physical significance, Divergence & curl of a vector field and related problems
Vector integration. line surface & volume integrals, Stokes, gauss &greens theorems. simple applications.
Mechanics of particles: laws of motion, motion of variable mass system- rocket, multi stage rocket.
Conservation of energy & momentum, collisions in 2&3 Dimensions, Concept of impact parameter, .
scattering cross section & Rutherford's scattering, Def of rigid body, rotational kinematics.
equation of motion for a rotating body, combined translational and rotational motion, Angular momentum, inertia tensor Euler equations., precession of top, Gyroscope
Precession of equinoxes rotating frames of reference, Coriolis force, effects elastic constants of isotropic solids & their relations., Poissons ratio and expressions for σ in terms of Y,n,k,
Classification of beams, Types of bending., point load, distributed load, shearing force & bending moment, Sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with end load.
Central forces: def, examples, Conservative nature of Central forces. Central forces as a negative gradient of P.E, Equation of motion under Central forces.
Gravitational potential and field and their relation, Motion under inverse square law, derivation of Kepler's laws.
Special theory of relativity: Galilean relativity, absolute frames, Satellite motion, Newton's laws from Kepler's laws.
Michelson-Morley expt, postulates of relativity, Lorentz transformations, time dilation, length contraction.
variation of mass with velocity, mass energy relation, Momentum and energy relation, Addition of velocities, Concept of four vector formalism.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: **Physics** Paper: **I A** (MECHANICS) Class: **I B.Sc** Semester: **I**

Topics
Vector analysis: scalar and vector fields, gradient of scalar fields & its physical significance.
Divergence & curl of a vector field and related problems, Vector integration. line surface & volume integrals
Stokes, gauss &greens theorems. simple applications, Mechanics of particles: laws of motion, motion of variable mass system- rocket, multi stage rocket.
Conservation of energy & momentum, collisions in 2&3 Dimensions, Concept of impact parameter, scattering cross section & Rutherford's scattering.
Def of rigid body, rotational kinematics, equation of motion for a rotating body, combined translational and rotational motion,
Angular momentum, inertia tensor Euler equations, precession of top, Gyroscope, precession of equinoxes rotating frames of reference. Coriolis force, effects elastic constants of isotropic solids & their relations,
Poissons ratio and expressions for σ in terms of Y,n,k., Classification of beams, Types of bending, point load, distributed load, shearing force & bending moment
Sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with end load.
Central forces: def, examples, Conservative nature of Central forces. Central forces as a negative gradient of P.E,
Equation of motion under Central forces. Gravitational potential and field and their relation,
Motion under inverse square law, derivation of Kepler's laws. Satellite motion, Newton's laws from Kepler's laws, Special theory of relativity: Galilean relativity,
Absolute frames, Michelson-Morley expt,postulates of relativity, Lorentz transformations, time dilation, length contraction,
variation of mass with velocity, mass energy relation, Momentum and energy relation, Addition of velocities, Concept of four vector formalism,

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2015-16

Department: **Physics** Paper: **I A** (MECHANICS) Class: **I B.Sc** Semester: **I**

Topics
Vector analysis: scalar and vector fields, gradient of scalar fields & its physical significance.
Divergence & curl of a vector field and related problems, Vector integration. line surface & volume integrals
Stokes, gauss &greens theorems. simple applications, Mechanics of particles: laws of motion,
motion of variable mass system- rocket, multi stage rocket, Conservation of energy & momentum,
collisions in 2&3 Dimensions, Concept of impact parameter, scattering cross section & Rutherford's scattering.
Def of rigid body, rotational kinematics, equation of motion for a rotating body, combined translational and rotational motion,
Angular momentum, inertia tensor Euler equations, precession of top, Gyroscope, precession of equinoxes rotating frames of reference.
Coriolis force, effects elastic constants of isotropic solids & their relations, Poissons ratio and expressions for σ in terms of Y,n,k.
Classification of beams, Types of bending, point load, distributed load, shearing force & bending moment, Sign conventions, simple supported beam carrying a concentrated load at mid span, Cantilever with end load.
Central forces: def, examples, Conservative nature of Central forces. Central forces as a negative gradient of P.E,
Equation of motion under Central forces. Gravitational potential and field and their relation, Motion under inverse square law
, derivation of Kepler's laws. Satellite motion, Newton's laws from Kepler's laws,
Special theory of relativity: Galilean relativity, absolute frames, Michelson-Morley expt, postulates of relativity. Lorentz transformations, time dilation
length contraction, variation of mass with velocity, mass energy relation. Momentum and energyrelation,Addition of velocities, Concept of four vector formalism.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: **Physics** Paper: **I A** (MECHANICS) Class: **I B.Sc** Semester: **I**

Topics
Vector analysis: scalar and vector fields, gradient of scalar fields & its physical significance.
Divergence & curl of a vector field and related problems, Vector integration. line surface & volume integrals,
Statement of stokes, gauss &greens theorems.
motion of variable mass system- rocket, multi stage rocket
collisions in 2&3 Dimensions, Concept of impact parameter, scattering cross section & Rutherford's scattering.
Def of rigid body, rotational kinematics, equation of motion for a rotating body.
Angular momentum, inertia tensor Euler equations, precession of top, Gyroscope.
Classification of beams, Types of bending, point load, distributed load, shearing force & bending moment
Sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with end load.
Derivation of unit vector, Radial and trasfor acceleration, Equation of motion under Central forces, Motion under inverse square law
, Derivation of Kepler'slaws,Special theory of relativity: Absolute frames, Michelson-Morley expt,
Frames of reference, inertial and non-inertial frames, Galilean relativity.
Postulates of relativity, Lorentz transformations,
Time dilation, and its Experimental verification, length contraction.mass energy relation,

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2013-14

Department: **Physics** Paper: **I A** (MECHANICS) Class: **I B.Sc** Semester: **I**

Topics
Vector analysis: scalar and vector fields, gradient of scalar fields & its physical significance.
Divergence & curl of a vector field and related problems, Vector integration. line surface & volume integrals,
Statement of stokes, gauss &greens theorems.
motion of variable mass system- rocket, multi stage rocket, collisions in 2&3 Dimensions.
Concept of impact parameter, scattering cross section & Rutherford's scattering.
Def of rigid body, rotational kinematics, equation of motion for a rotating body.
Angular momentum, inertia tensor Euler equations, precession of top, Gyroscope.
Classification of beams.,Types of bending, point load, distributed load, shearing force & bending moment
Sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with end load.
Central forces: def, examples, Conservative nature of Central forces, Central forces as a negative gradient of P.E.
Derivation of unit vector, Radial and trasfor acceleration, Equation of motion under Central forces.
Motion under inverse square law, Derivation of Kepler's laws,
Special theory of relativity: Absolute frames,
Michelson-Morley expt, Frames of reference, inertial and non-inertial frames, Galilean relativity.
Postulates of relativity, Lorentz transformations, Time dilation, and its Experimental verification, length contraction.mass energy relation,

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2018-19

Department: **Physics** Paper: **I B (WAVES & OSCILLATIONS)** Class: **I B.SC** Semester: **II**

Topics
simple harmonic oscillator and solution of the differential equation-- physical characteristics of SHM-- Torsion Pendulum- Measurement of rigidity modulus
Compound Pendulum – Measurement of 'g'-- Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies,
Lissajou's figures and uses. Damped harmonic oscillator--solution of the differential equation of damped oscillator, Energy considerations,
Comparision with un damped H.O,logartimic decrement, relaxation time, quality factor. Differ eqn of forced oscillations and Solution, amplitude resonance, velocity resonance,
Complex vibrations, Fourier theorem & evaluation of Fourier coeffs,analysis of periodic wave functions, Square , triangle, saw tooth wave & problems
Longitudinal vibrations in Bars—wave equation and its general solution-
Special cases (1) Bar fixed at both ends (2) Bar fixed at the midpoint
Clamped free bar, free-free bar, bar supported at both ends, Tuning fork.
Transverse wave propagation along a stretched string, general solution of wave equation and its significance
Modes of vibration of stretched string clamped at both ends, overtones, energy density -- energy transport, transverse impedance, Ultrasonics: ultrasonics introduction, properties, production.
Piezo electric method, magnetostriction method, detection. Determination of wave length of ultrasonics
Velocity of ultrasonics in liquids by Sear's method – applications

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: **Physics** Paper: **I B (WAVES & OSCILLATIONS)** Class: **I B.SC** Semester: **II**

Topics
simple harmonic oscillator and solution of the differential equation-- physical characteristics of SHM-- Torsion Pendulum- Measurement of rigidity modulus
Compound Pendulum – Measurement of 'g'-- Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies,Lissajou's figures and uses.
Damped harmonic oscillator--solution of the differential equation of damped oscillator, Energy considerations,Comparision with un damped H.O,logartimic decrement,
Relaxation time, quality factor. Differ eqn of forced oscillations and Solution amplitude resonance, velocity resonance, complex vibrations, Fourier theorem & evaluation of Fourier coeffs,
Analysis of periodic wave functions, Square , triangle, saw tooth wave & problems
Longitudinal vibrations in Bars—wave equation and its general solution-
Special cases (1) Bar fixed at both ends (2) Bar fixed at the midpoint
Clamped free bar, free-free bar, bar supported at both ends, Tuning fork, Transverse wave propagation along a stretched string, general solution of wave equation and its significance
Modes of vibration of stretched string clamped at both ends, overtones, energy density -- energy transport, transverse impedance.
Ultrasonics: ultrasonics introduction, properties, production. Piezo electric method,
magnetostriction method, detection. Determination of wave length of ultrasonics
Velocity of ultrasonics in liquids by Sear's method – applications,

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2016-17

Department: **Physics** Paper: **I B (WAVES & OSCILLATIONS)** Class: **I B.SC** Semester: **II**

Topics
simple harmonic oscillator and solution of the differential equation-- physical characteristics of SHM-- Torsion Pendulum- Measurement of rigidity modulus
Compound Pendulum – Measurement of 'g'-- Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies,Lissajou's figures and uses.
Damped harmonic oscillator--solution of the differential equation of damped oscillator, Energy considerations,Comparision with un damped H.O,logartimic decrement, relaxation time, quality factor. Differ eqn of forced oscillations and Solution
amplitude resonance, velocity resonance, complex vibrations, Fourier theorem & evaluation of Fourier coeffs,
analysis of periodic wave functions, Square , triangle, saw tooth wave & problems
Longitudinal vibrations in Bars—wave equation and its general solution-
Special cases (1) Bar fixed at both ends (2) Bar fixed at the midpoint
Clamped free bar, free-free bar, bar supported at both ends, Tuning fork, Transverse wave propagation along a stretched string, general solution of wave equation and its significance
Modes of vibration of stretched string clamped at both ends, overtones, energy density -- energy transport, transverse impedance.
Ultrasonics: ultrasonics introduction, properties, production. Piezo electric method,
magnetostriction method, detection. Determination of wave length of ultrasonics
Velocity of ultrasonics in liquids by Sear's method – applications

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2015-16

Department: **Physics** Paper: **I B (WAVES & OSCILLATIONS)** Class: **I B.SC** Semester: **II**

Topics
simple harmonic oscillator and solution of the differential equation-- physical characteristics of SHM-- Torsion Pendulum- Measurement of rigidity modulus
Compound Pendulum – Measurement of 'g'-- Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies,Lissajou's figures and uses.
Damped harmonic oscillator--solution of the differential equation of damped oscillator, Energy considerations,Comparision with un damped H.O,logartimic decrement,
Relaxation time, quality factor. Differ eqn of forced oscillations and Solution amplitude resonance, velocity resonance, complex vibrations, Fourier theorem & evaluation of Fourier coeffs,
analysis of periodic wave functions, Square , triangle, saw tooth wave & problems
Longitudinal vibrations in Bars—wave equation and its general solution-
Special cases (1) Bar fixed at both ends (2) Bar fixed at the midpoint
Clamped free bar, free-free bar, bar supported at both ends, Tuning fork.
Transverse wave propagation along a stretched string, general solution of wave equation and its significance
Modes of vibration of stretched string clamped at both ends, overtones, energy density -- energy transport, transverse impedance.,Ultrasonics: ultrasonics introduction, properties, production.
Piezo electric method, magnetostriction method, detection. Determination of wave length of ultrasonics
Velocity of ultrasonics in liquids by Sear's method – applications,

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2014-15

Department: **Physics** Paper: **I B (WAVES & OSCILLATIONS)** Class: **I B.SC** Semester: **II**

Topics
simple harmonic oscillator and solution of the differential equation-- physical characteristics of SHM-- Torsion Pendulum- Measurement of rigidity modulus
Compound Pendulum – Measurement of 'g'-- Combination of two mutually perpendicular simple harmonic vibrations of same frequency,Lissajou's figures.
Damped harmonic oscillator--solution of the differential equation of damped oscillator, Energy considerations,
Logartimic decrement, relaxation time, quality factor. Differ eqn of forced oscillations and Solution
amplitude resonance, complex vibrations: Fourier theorem & evaluation of Fourier coeffs, analysis of periodic wave functions,
Square , triangle wave & problems , Longitudinal vibrations in Bars—wave equation and its general solution.
Special cases (1) Bar fixed at both ends (2) Bar fixed at the midpoint
Clamped free bar, bar supported at both ends, Transverse wave propagation along a stretched string.
General solution of wave equation and its significance Modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance.
Ultrasonics:ultrasonics introduction, properties, production. Piezo electric method, Magnetostriction method, detection,Applications of ultrasonics
Noise pollution – Origen effect on environment prevention .

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2013-14

Department: **Physics** Paper: **I B (WAVES & OSCILLATIONS)** Class: **I B.SC** Semester: **II**

Topics
simple harmonic oscillator and solution of the differential equation-- physical characteristics of SHM-- Torsion Pendulum- Measurement of rigidity modulus
Compound Pendulum – Measurement of 'g'-- Combination of two mutually perpendicular simple harmonic vibrations of same frequency,Lissajou's figures.
Damped harmonic oscillator--solution of the differential equation of damped oscillator, Energy considerations,
Logartimic decrement, relaxation time, quality factor. Differ eqn of forced oscillations and Solution
amplitude resonance, complex vibrations: Fourier theorem & evaluation of Fourier coeffs, analysis of periodic wave functions,
Square , triangle wave & problems , Longitudinal vibrations in Bars—wave equation and its general solution.
Special cases (1) Bar fixed at both ends (2) Bar fixed at the midpoint
Clamped free bar, bar supported at both ends, Transverse wave propagation along a stretched string.
General solution of wave equation and its significance Modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance.
Ultrasonics:ultrasonics introduction, properties, production. Piezo electric method, Magnetostriction method, detection,Applications of ultrasonics
Noise pollution – Origen effect on environment prevention .

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2018-19

Department: Physics Paper : **II** A **(WAVE-OPTICS)** Class: **II** BSc Semester: **III**

Topics
Introduction to light. Different theories of light wave propagation. Related definitions to light
Aberrations: Introduction - Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration - coma, astigmatism, curvature of the field, distortion.
Chromatic aberration – the achromatic doubletAchromatismfortwolenses(1)incontactand(2)separated by a distance
Interference: principle of superposition-coherence-temporal coherence and spatial coherence-conditions for interference of light.
Fresnel's biprism- determination of wavelength of light-change of phase on reflection. Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law).
Colors of thin films, interference by film with two non parallel reflecting surfaces(wedge shaped films)-determination of diameter of wire.
Newton's rings in reflected light-Determination of wavelength of monochromatic light Michelson interferometer--types of fringes-- determination of wavelength of monochromatic light and thickness of a thin transparent plate
Diffraction: Introduction – Distinction between Fresnel and Fraunhoffer diffraction. Diffraction due to single slit -- limit of resolution-- Fraunhoffer diffraction due to double slit
Fraunhoffer diffraction pattern with N-slits (diffraction grating). Resolving power of grating -- determination of wavelength of light in normal and minimum deviation methods using diffraction grating
, Fresnel diffraction—Fresnel's half period Zones — area of the half period zones - zone plate — comparison of zone plate with convex lens.
Difference between interference and diffraction. Polarization: Polarized light — methods of polarization, polarization by reflection, refraction, double refraction, scattering of light.Brewsters law-Malous law. Nichol prism, polariser and analyser. Quarter wave plate-half wave plate.
Optical activity, determination of specific rotation by Laurent's half shade polarimeter. Babinet's compensator-idea of elliptical and circular polarisation
Lasers-Fiber optics and holography-introduction- Spontaneous and stimulated emission. Population inversion
- f iber materials - principles of fiber communication (qualitaftive treatment only) - advantages of fiber optic communication.
Holography: Basic principle of holography .Gabor hologram and its limitations-applications of holography.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2017-18

Department: Physics Paper : **II** A **(WAVE-OPTICS)** Class: **II** BSc Semester: **III**

Topics
Introduction to light. Different theories of light wawe propagation. Related definitions to light
Aberrations: Introduction - Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration - coma, astigmatism, curvature of the field, distortion.
Chromatic aberration – the achromatic doubletAchromatismfortwolenses(1)incontactand(2)separated by a distance
Interference: principle of superposition-coherence-temporal coherence and spatial coherence-conditions for interference of light.
Fresnel's biprism- determination of wavelength of light-change of phase on reflection. Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law).
Colors of thin films, interference by film with two non parallel reflecting surfaces(wedge shaped films)-determination of diameter of wire.
Newton's rings in reflected light-Determination of wavelength of monochromatic light Michelson interferometer--types of fringes-- determination of wavelength of monochromatic light and thickness of a thin transparent plate
Diffraction: Introduction – Distinction between Fresnel and Fraunhoffer diffraction. Diffraction due to single slit -- limit of resolution-- Fraunhoffer diffraction due to double slit
Fraunhoffer diffraction pattern with N-slits (diffraction grating). Resolving power of grating -- determination of wavelength of light in normal and minimum deviation methods using diffraction grating
, Fresnel diffraction—Fresnel's half period Zones — area of the half period zones - zone plate — comparison of zone plate with convex lens.
Difference between interference and diffraction. Polarization: Polarized light — methods of polarization, polarization by reflection, refraction, double refraction, scattering of light.Brewsters law-Malous law. Nichol prism, polariser and analyser. Quarter wave plate-half wave plate.
Optical activity, determination of specific rotation by Laurent's half shade polarimeter. Babinet's compensator-idea of elliptical and circular polarisation
Lasers-Fiber optics and holography-introduction- Spontaneous and stimulated emission. Population inversion
laser principle, -- types of lasers — Einsteins coefficients-He-Ne laser- Ruby laser - applications of lasers. Fiber optics: Introduction - optical fibers -different types of l fibers ..
- f iber materials - principles of fiber communication (qualitaftive treatment only) - advantages of fiber optic communication.
Holography: Basic principle of holography .Gabor hologram and its limitations-applications of holography

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: Physics Paper : **II** A **(WAVE-OPTICS)** Class: **II** BSc Semester: **III**

Topics
Introduction to light. Different theories of light wawe propagation. Related definitions to light
Aberrations: Introduction - Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration - coma, astigmatism, curvature of the field, distortion.
Chromatic aberration – the achromatic doublet—Achromatism for two lenses (1)in contact and(2) separated by a distance
Interference: principle of superposition-coherence-temporal coherence and spatial coherence-conditions for interference of light.
Fresnel's biprism- determination of wavelength of light-change of phase on reflection. Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law).
Colors of thin films, interference by a film with two non parallel reflecting surfaces(wedge shaped films)-determination of diameter of wire.
Newton's rings in reflected light-Determination of wavelength of monochromatic light Michelson interferometer--types of fringes-- determination of wavelength of monochromatic light and thickness of a thin transparent plate
- Diffraction: Introduction – Distinction between Fresnel and Fraunhoffer diffraction. Diffraction due to single slit -- limit of resolution-- Fraunhoffer diffraction due to double slit
Fraunhoffer diffraction pattern with N-slits (diffraction grating). Resolving power of grating -- determination of wavelength of light in normal and minimum deviation methods using diffraction grating
Fresnel diffraction—Fresnel's half period Zones — area of the half period zones - zone plate — comparison of zone plate with convex lens.
Difference between interference and diffraction. Polarization: Polarized light — methods of polarization, polarization by reflection, refraction, double refraction, scattering of light.Brewsters law-Malous law. Nichol prism, polariser and analyser. Quarter wave plate-half wave plate.
Optical activity, determination of specific rotation by Laurent's half shade polarimeter. Bobbinet's compensator-idea of elliptical and circular polarisation.
Lasers-Fiber optics and holography-introduction- Spontaneous and stimulated emission. Population inversion
-., laser principle, -- types of lasers — Einsteins coefficients-He-Ne laser- Ruby laser - applications of lasers. Fiber optics: Introduction - optical fibers -different types of l fibers ..
f iber materials - principles of fiber communication (qualitaftive treatment only) - advantages of fiber optic communication.
Holography: Basic principle of holography .Gabor hologram and its limitations-applications of holography.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2015-16

Department: Physics Paper : **II** A **(WAVE-OPTICS)** Class: **II** BSc Semester: **III**

Topics
Matrix method in paraxial optics: Introduction, The matrix method, effect of translation, effect of refraction.
Imaging by spherical refracting surface, Imaging by co-axial optical system
nit and nodal planes, A system of two thin lenses.AberrationsU: Introduction - Monochromatic aberrations, spherical aberration
methods of minimizing spherical aberration - coma, astigmatism
Chromatic aberration – the achromatic doublet—Removal of Chromatic aberration by a separated doublet. Defects of Eye – Myopia and Hypermetropia – correction.
Interference: Principle of superposition - coherence - conditions for interference of light
Interference by division of wave front: Fresnel's biprism--determination of wavelength of light, determination of thickness of a transparent material using a biprism. Change of phase on reflection - Lloyds' mirror experiment
Interference by division of amplitude: oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law) -- colors of thin films--non reflecting films, interference by a plane parallel film illuminated by a point source
Interference by a film with two non parallel reflecting surfaces (wedge shaped films)—determination of diameter of wire, Newton's rings in reflected light with contact between lens and glass plate.
Determination of wavelength of monochromatic light. Michelson interferometer--types of fringes-- determination of wavelength of monochromatic light and thickness of a thin transparent plate
Diffraction: Introduction – Distinction between Fresnel and Fraunhoffer diffraction. Diffraction due to single slit -- limit of resolution-- Fraunhoffer diffraction due to double slit
Fraunhoffer diffraction pattern with N-slits (diffraction grating). Resolving power of grating -- determination of wavelength of light in normal and oblique incidence methods using diffraction grating.
Fresnel diffraction—Fresnel's half period Zones — area of the half period zones - zone plate — comparison of zone plate with convex lens—phase reversal zone plate. Difference between interference and diffraction. Polarization: Polarized light — methods of polarization, polarization by reflection, refraction, double refraction, selective absorption.
scattering of light - Brewster's law - Mauls law. Nichol prism - polarizer and analyzer - refraction of plane wave incident on negative and positive crystals (Huygens's explanation) quarter wave plate—half wave plate. Optical activity, analysis of light by Laurent's half shade polarimeter. Lasers-Fiber optics and holography: Introduction - Spontaneous and stimulated emission
Population inversion, laser principle, -- types of lasers —He-Ne laser- Ruby laser - applications of lasers. Fiber optics: Introduction - optical fibers - types of optical fibers - step index and graded index fibers. iber materials - principles of fiber communication (qualitaftive treatment only) and advantages of fiber communication.
Holography: Basic principle of holography and its applications.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: Physics Paper : **II** A **(WAVE-OPTICS)** Class: **II** BSc Semester: **III**

Topics
Matrix method in paraxial optics: Introduction, The matrix method, effect of translation, effect of refraction.
Imaging by spherical refracting surface, Imaging by co-axial optical system
unit and nodal planes, A system of two thin lenses.AberrationsU: Introduction - Monochromatic aberrations, spherical aberration
methods of minimizing spherical aberration - coma, astigmatism
Chromatic aberration – the achromatic doublet—Removal of Chromatic aberration by a separated doublet. Defects of Eye – Myopia and Hypermetropia – correction.
Interference: Principle of superposition - coherence - conditions for interference of light
Interference by division of wave front: Fresnel's biprism--determination of wavelength of light, determination of thickness of a transparent material using a biprism. Change of phase on reflection - Lloyds' mirror experiment
Interference by division of amplitude: oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law) -- colors of thin films--non reflecting films, interference by a plane parallel film illuminated by a point source
Interference by a film with two non parallel reflecting surfaces (wedge shaped films)—determination of diameter of wire, Newton's rings in reflected light with contact between lens and glass plate.
Determination of wavelength of monochromatic light. Michelson interferometer--types of fringes-- determination of wavelength of monochromatic light and thickness of a thin transparent plate.
Diffraction: Introduction – Distinction between Fresnel and Fraunhoffer diffraction. Diffraction due to single slit -- limit of resolution-- Fraunhoffer diffraction due to double slit
Fraunhoffer diffraction pattern with N-slits (diffraction grating). Resolving power of grating -- determination of wavelength of light in normal and oblique incidence methods using diffraction grating. Fresnel diffraction—Fresnel's half period Zones — area of the half period zones - zone plate — comparison of zone plate with convex lens—phase reversal zone plate.
Difference between interference and diffraction. Polarization: Polarized light — methods of polarization, polarization by reflection, refraction, double refraction, selective absorption. scattering of light - Brewster's law - Mauls law. Nichol prism - polarizer and analyzer - refraction of plane wave incident on negative and positive crystals (Huygens's explanation)
. quarter wave plate—half wave plate. Optical activity, analysis of light by Laurent's half shade polarimeter. Lasers-Fiber optics and holography: Introduction - Spontaneous and stimulated emission. Population inversion, laser principle, -- types of lasers —He-Ne laser- Ruby laser - applications of lasers. Fiber optics: Introduction - optical fibers - types of optical fibers - step index and graded index fibers.
fiber materials - principles of fiber communication (qualitaftive treatment only) and advantages of fiber communication. Holography: Basic principle of holography and its applications.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2013-14

Department: Physics Paper : **II** A **(WAVE-OPTICS)** Class: **II** BSc Semester: **III**

Topics
Imaging by spherical refracting surface, Imaging by co-axial optical system , Unit and nodal planes, A system of two thin lenses.Aberrations: Introduction - Monochromatic aberrations, spherical aberration
methods of minimizing spherical aberration - coma, astigmatism, Chromatic aberration – the achromatic doublet—Removal of Chromatic aberration by a separated doublet.
Defects of Eye – Myopia and Hypermetropia – correction. Interference: Principle of superposition - coherence - conditions for interference of light
Interference by division of wave front: Fresnel's biprism--determination of wavelength of light, determination of thickness of a transparent material using a biprism. Change of phase on reflection - Lloyds' mirror experiment
Interference by division of amplitude: oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law) -- colors of thin films--non reflecting films, interference by a plane parallel film illuminated by a point source
Interference by a film with two non parallel reflecting surfaces (wedge shaped films)—determination of diameter of wire, Newton's rings in reflected light with contact between lens and glass plate
Determination of wavelength of monochromatic light. Michelson interferometer--types of fringes-- determination of wavelength of monochromatic light and thickness of a thin transparent plate
Diffraction: Introduction – Distinction between Fresnel and Fraunhoffer diffraction. Diffraction due to single slit -- limit of resolution-- Fraunhoffer diffraction due to double slit
Fraunhoffer diffraction pattern with N-slits (diffraction grating). Resolving power of grating -- determination of wavelength of light in normal and oblique incidence methods using diffraction grating.
Fresnel diffraction—Fresnel's half period Zones — area of the half period zones - zone plate — comparison of zone plate with convex lens—phase reversal zone plate.
Difference between interference and diffraction. Polarization: Polarized light — methods of polarization, polarization by reflection, refraction, double refraction, selective absorption, scattering of light - Brewster's law - Malus law. Nichol prism - polarizer and analyzer - refraction of plane wave incident on negative and positive crystals (Huygens's explanation)
quarter wave plate—half wave plate. Optical activity, analysis of light by Laurent's half shade polarimeter. Lasers-Fiber optics and holography: Introduction - Spontaneous and stimulated emission. Population inversion, laser principle, -- types of lasers —He-Ne laser- Ruby laser - applications of lasers. Fiber optics: Introduction - optical fibers - types of optical fibers - step index and graded index fibers.
fiber materials - principles of fiber communication (qualitaftive treatment only) and advantages of fiber communication, Holography: Basic principle of holography and its applications. Doubts clarification

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2018-19

Department: Physics Paper: II B (THERMODYNAMICS& RADIATION PHYSICS)
Class: II BSc Semester: IV

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds Experimental verification -transport phenomina
Viscosity of gases - -thermal conductivity and diffusion of gases.Mean free path **Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-isothermal and adiabatic process
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagramand its uses.change of entropy of a perfect gas. Change of entropy when ice changes in to steam.
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas. Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
. **Low temperature physics:** Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
- Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
- Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law
Measurement of radiation--types pyrometer Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of Sun.
. Doubt clarification and problem solving

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: Physics Paper: II B (THERMODYNAMICS& RADIATION PHYSICS)

Class: II BSc Semester:IV

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds Experimental verification -transport phenomina
Viscosity of gases - -thermal conductivity and diffusion of gases.Mean free path **Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-isothermal and adiabatic process
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagramand its uses.change of entropy of a perfect gas. Change of entropy when ice changes in to steam.
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Cat1 examinations-Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas. Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
. **Low temperature physics:** Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
- Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law
Measurement of radiation--types pyrometer Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of Sun. Doubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: Physics Paper: II B(THERMODYNAMICS& RADIATION PHYSICS)

Class: II BSc Semester: IV

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds Experimental verification -transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases. Mean free path **Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-isothermal and adiabatic process
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - - thermodynamic scale of temperature-entropy, physical significance
Cat1 examinations- Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagramand its uses. change of entropy of aperfect gas. Change of entropy when ice changes in to steam
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas. Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
. **Low temperature physics:** Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - -quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law
Measurement of radiation--types pyrometer Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of Sun. Doubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2015-16

Department: **Physics** Paper: **IIB (THERMODYNAMICS)** Class: **II BSc** Semester: **IV**

Topics
Kinetic theory of gases: Introduction - Maxwell's law of distribution of molecular speeds— experimental verification-toothed wheel experiment -transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases.**Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagram
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas.
Cat1 examinations- Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
Low temperature physics: Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures, Principle of refrigeration—vapour compression type. Working of refrigerator and Air conditioning machines
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures, **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law., Deduction of Wein's law, Rayleigh-Jean's law from Planck's law. Measurement of radiation--types pyrometer
Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of SunDoubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: **Physics** Paper: **IIB (THERMODYNAMICS)** Class: **II BSc** Semester: **IV**

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds-experimental verification-toothed wheel experiment-transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases.**Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagram
Thermodynamic potential and Maxwell's equations: Thermodynamic potential l-- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas.
Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
Low temperature physics: Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures Principle of refrigeration—vapour compression type. Working of refrigerator and Air conditioning machines.
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law. Measurement of radiation--types pyrometer-
Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer determination of Solar constant—effective temperature of SunDoubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2013-14

Department: **Physics** Paper: **IIB (THERMODYNAMICS)** Class: **II BSc** Semester: **IV**

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds-experimental verification-toothed wheel experiment-transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases.**Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance.
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagram
Thermodynamic potential and Maxwell's equations: Thermodynamic potential l-- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas.
Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
Low temperature physics: Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
, Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
Principle of refrigeration—vapour compression type. Working of refrigerator and Air conditioning machines.
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures, **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law., Deduction of Wein's law, Rayleigh-Jean's law from Planck's law. Measurement of radiation--types pyrometer-
Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of SunDoubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2018-19

Department: Physics Paper: II B (THERMODYNAMICS& RADIATION PHYSICS)
Class: II BSc Semester: IV

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds Experimental verification -transport phenomina
Viscosity of gases - -thermal conductivity and diffusion of gases.Mean free path **Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-isothermal and adiabatic process
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagramand its uses.change of entropy of a perfect gas. Change of entropy when ice changes in to steam.
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas. Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
. **Low temperature physics:** Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
- Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
- Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law
Measurement of radiation--types pyrometer Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of Sun.
. Doubt clarification and problem solving

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: Physics Paper: II B (THERMODYNAMICS& RADIATION PHYSICS)

Class: II BSc Semester:IV

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds Experimental verification -transport phenomina
Viscosity of gases - -thermal conductivity and diffusion of gases.Mean free path **Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-isothermal and adiabatic process
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagramand its uses.change of entropy of a perfect gas. Change of entropy when ice changes in to steam.
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Cat1 examinations-Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas. Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
. **Low temperature physics:** Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
- Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law
Measurement of radiation--types pyrometer Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of Sun. Doubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: Physics Paper: II B(THERMODYNAMICS& RADIATION PHYSICS)

Class: II BSc Semester: IV

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds Experimental verification -transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases. Mean free path **Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-isothermal and adiabatic process
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - - thermodynamic scale of temperature-entropy, physical significance
Cat1 examinations- Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagramand its uses. change of entropy of aperfect gas. Change of entropy when ice changes in to steam
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas. Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
. **Low temperature physics:** Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - -quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law
Measurement of radiation--types pyrometer Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of Sun. Doubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2015-16

Department: **Physics** Paper: **IIB (THERMODYNAMICS)** Class: **II BSc** Semester: **IV**

Topics
Kinetic theory of gases: Introduction - Maxwell's law of distribution of molecular speeds— experimental verification-toothed wheel experiment -transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases.**Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagram
Thermodynamic potential and Maxwell's equations: Thermodynamic potential -- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas.
Cat1 examinations- Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
Low temperature physics: Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures, Principle of refrigeration—vapour compression type. Working of refrigerator and Air conditioning machines
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures, **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law., Deduction of Wein's law, Rayleigh-Jean's law from Planck's law. Measurement of radiation--types pyrometer
Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of SunDoubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: **Physics** Paper: **IIB (THERMODYNAMICS)** Class: **II BSc** Semester: **IV**

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds-experimental verification-toothed wheel experiment-transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases.**Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagram
Thermodynamic potential and Maxwell's equations: Thermodynamic potential l-- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas.
Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
Low temperature physics: Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures Principle of refrigeration—vapour compression type. Working of refrigerator and Air conditioning machines.
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law. Deduction of Wein's law, Rayleigh-Jean's law from Planck's law. Measurement of radiation--types pyrometer-
Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer determination of Solar constant—effective temperature of SunDoubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2013-14

Department: **Physics** Paper: **IIB (THERMODYNAMICS)** Class: **II BSc** Semester: **IV**

Topics
Kinetic theory of gases: Introduction - Deduction of Maxwell's law of distribution of molecular speeds-experimental verification-toothed wheel experiment-transport phenomina.
Viscosity of gases - -thermal conductivity and diffusion of gases.**Thermodynamics:** Introduction - reversible and irreversible processes. Carnot's engine and its efficiency-
Carnot's theorem. Second law of thermodynamics, Kelvin's and Claussius statements - -thermodynamic scale of temperature-entropy, physical significance.
Change in entropy in reversible and irreversible process Entropy and disorder. Entropy of universe- Temperature – Entropy (T-S) diagram
Thermodynamic potential and Maxwell's equations: Thermodynamic potential l-- derivation of Maxwell's thermodynamic relation
Claussius-Clapeyron's equation. Derivations for ratio of two specific heats - Derivations for difference of two specific heats of a perfect gas.
Joule-Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas
Low temperature physics: Joule-Kelvin effect—liquefaction of gas using porous plug experiment distinction between adiabatic and Joule Thomson expansion
, Expression for Joule Thomson cooling-liquefaction of helium. Kapitza's method, adiabatic demagnetization-production of low temperatures
Principle of refrigeration—vapour compression type. Working of refrigerator and Air conditioning machines.
Effect of Chloro-Fluoro carbons on Ozone layer. Applications of substances at low temperatures, **Quantum theory of radiation:** Black body-- Fery's black body-- distribution of energy in the spectrum of black body.
Statements of Wein's displacement law, Wein's law and Rayleigh-Jean's law - - quantum theory of radiation Derivation of Planck's law., Deduction of Wein's law, Rayleigh-Jean's law from Planck's law. Measurement of radiation--types pyrometer-
Disappearing filament optical pyrometer.experimental determination. Angstrom pyreheliometer
determination of Solar constant—effective temperature of SunDoubt clarification and problem solving.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: **Physics** Paper: **IIIA (ELECTRICITY, MAGNITISM&ELECTRONICS)**

Class: **III B.Sc.** Semester**: V**

Topics
Electric Field Intensity and Potential: Gauss's Law statements and it's proof, Electric Field intensity due to (1) Uniformly Charged Sphere (2) an infinite conducting sheet of charge
Electrical Potential – equipotential surfaces – potential due to (1) a point charge, (ii) Charaged spherical shell
Dielectrics: Electric Dipole moment and molecular polarizability – Electric Displacement D, Electric polarization P
Relation between D, E, P - Dielectric Constant and susceptibility Boundary conditions at the dielectric surface
Electric and magnetic Fields Biot-Savart's Law, explanation and explanation and calculation of B due to long straight wire, a circular current loop and solenoid
Hall Effect – Determination of Hall Coefficient and applications. Electro Magnetic Induction, Faraday's Law – Lenz's Law - Self and mutual Inductance. Coefficient of coupling.
Calculation of Self inductance of a long solenoid, energy stored in magnetic field. Transformer - energy losses - Efficiency
Alternating Current and electromagnetic waves alternating current – Relation between current and voltage in LR and CR circuits.
Maxwell's Equation (integral and differential Forms) (no derivation), Maxwell's wave equation (with derivation) Pointing Therom (statement) production of electromagnectic waves (Hertz experiment).
Basic Electronics: PN junction Diode, Zener Diode, I-V characteristics, PNP and NPN transistors
CB, CE and CC configurations - Relation between α, β and γ. transistor (CE) characteristics, transistor as an amplifier. Digital Electronics Number Systems - Converstion .
Binary Subtraction (2's compliment methods). Laws of Boolean Algebra. De Morgans Laws – statements and proofs.
Basic Logic Gates, NAND and NOR as universal gates, exclusive OR gate, Half adder and full adder.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: **Physics** Paper: **IIIA (ELECTRICITY, MAGNITISM&ELECTRONICS)**

Class: **III B.Sc.** Semester**: V**

Topics
Electric Field Intensity and Potential: Gauss's Law statements and it's proof, Electric Field intensity due to (1) Uniformly Charged Sphere (2) an infinite conducting sheet of charge
Electrical Potential – equipotential surfaces – potential due to (1) a point charge, (ii) Charaged spherical shell
Dielectrics: Electric Dipole moment and molecular polarizability – Electric Displacement D, Electric polarization P
Relation between D, E, P - Dielectric Constant and susceptibility Boundary conditions at the dielectric surface
Electric and magnetic Fields Biot-Savart's Law, explanation and explanation and calculation of B due to long straight wire, a circular current loop and solenoid
Hall Effect – Determination of Hall Coefficient and applications. Electro Magnetic Induction, Faraday's Law – Lenz's Law - Self and mutual Inductance. Coefficient of coupling.
Calculation of Self inductance of a long solenoid, energy stored in magnetic field. Transformer - energy losses - Efficiency
Alternating Current and electromagnetic waves alternating current – Relation between current and voltage in LR and CR circuits.
Vector Diagrams, LCR series and parallel resonant circuits, Q - factor , power in ac circuits. Maxwell's equation - Idea of displacement current
Maxwell's Equation (integral and differential Forms) (no derivation), Maxwell's wave equation (with derivation) Pointing Therom (statement and proof) production of electromagnectic waves (Hertz experiment).
Basic Electronics: PN junction Diode, Zener Diode, I-V characteristics, PNP and NPN transistors.
CB,CE and CC configurations – Relation between α, β and γ – transistor (CE) characteristics. Transistor as an amplifier.
Digital Electronics Number Systems - Converstion Binary Subtraction (2's compliment methods). Laws of Boolean Algebra. De Morgans Laws – statements and proofs.
Basic Logic Gates, NAND and NOR as universal gates, exclusive OR gate, Half adder and full adder .

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: **Physics** Paper: **IIIA (ELECTRICITY, MAGNITISM&ELECTRONICS)**

Class: **III B.Sc.** Semester**: V**

Topics
Gauss's Therom Proof Applications Electric Field due to infinite Conducting sheet of Charge, Field due to Uniformly Charged Sphere and Charged Cylinder
Deduction of Coulomb's Law. Mechanical Force on a Charged Conductor. Electric Potential. Potential due to the Charged Spherical Conductor. Electric Potential and field Strength due to electric Dipole and Infinite line of Charge.
Potential of a uniformly charged circular disk – Problems. Atomic view of dielectric. PE of dipole in electric field. Polarization - Charge Density.
Gauss Law in dielectrics. Relation between D,E and P. Dielectric Constant and susceptibility & relation between them.
Boundary conditions at the dielectric surface. Electric fields in cavities of dielectric. Needle shaped cavity and disc shaped cavity - Problems.
Capacity of concentric spheres. Cylindrical condenser, parallel plate capacitor with and without dielectric. Electric energy stored in a charged condenser.
Force between plates of a capacitor. Attracted disc electrometer. Construction and working of attracted disc electrometer, measurement of dielectric constant & potential difference. Problems.
Magnetic shell, Potential and filed due to magnetic shell-its equivalence with electric circuit & Magnetic shell. Magnetic induction B-and field H-permeability and susceptibility.-
Hall effect - Cyclotron, Sychrocyclotron and Synchrotron ,
Force on a current carrying conductor . Force and Torque on current loop. Biot-Savart law - B due to long straight wire.
B due to circular current loop and Solenoid - Problems.
Faradays laws - Lenz's Law - expression for induced emf - time varying magnetic fields - Betatron
Ballistic galvanometer - theory - Damping correction - Self and mutual inductance .
Coefficient of coupling - Calculation of self inductance of a long solenoid and toroid - Energy stored in magnetic field.
Principle of Transformer, construction, working, energy losses & efficiency -Problems.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2015-16

Department: **Physics** Paper: **IIIA (ELECTRICITY, MAGNITISM&ELECTRONICS)**

Class: **III B.Sc.** Semester**: V**

Topics
Gauss's Therom Proof Applications Electric Field due to infinite Conducting sheet of Charge, Field due to Uniformly Charged Sphere and Charged Cylinder
Deduction of Coulomb's Law. Mechanical Force on a Charged Conductor. Electric Potential. Potential due to the Charged Spherical Conductor. Electric Potential and field Strength due to electric Dipole and Infinite line of Charge.
Potential of a uniformly charged circular disk – Problems. Atomic view of dielectric. PE of dipole in electric field. Polarization - Charge Density.
Gauss Law in dielectrics. Relation between D,E and P. Dielectric Constant and susceptibility & relation between them.
Boundary conditions at the dielectric surface. Electric fields in cavities of dielectric. Needle shaped cavity and disc shaped cavity - Problems.
Capacity of concentric spheres. Cylindrical condenser, parallel plate capacitor with and without dielectric. Electric energy stored in a charged condenser.
Force between plates of a capacitor. Attracted disc electrometer. Construction and working of attracted disc electrometer, measurement of dielectric constant & potential difference. Problems.
Magnetic shell, Potential and filed due to magnetic shell-its equivalence with electric circuit & Magnetic shell. Magnetic induction B-and field H-permeability and susceptibility.-
Hall effect - Cyclotron, Sychrocyclotron and Synchrotron ,
Force on a current carrying conductor. Force and Torque on current loop. Biot-Savart law - B due to long straight wire.
B due to circular current loop and Solenoid - Problems.
Faradays laws - Lenz's Law - expression for induced emf - time varying magnetic fields - Betatron
Ballistic galvanometer - theory - Damping correction - Self and mutual inductance .
Coefficient of coupling - Calculation of self inductance of a long solenoid and toroid - Energy stored in magnetic field.
Principle of Transformer, construction, working, energy losses & efficiency -Problems.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)
(A College with Potential for Excellence)
Bhimavaram, W.G.Dist, A.P
Syllabus for the Academic Year 2014-15

Department: **Physics** Paper: **IIIA (ELECTRICITY, MAGNITISM&ELECTRONICS)**
Class: **III B.Sc.** Semester**: V**

Topics
Gauss's Therom Proof Applications Electric Field due to infinite Conducting sheet of Charge, Field due to Uniformly Charged Sphere and Charged Cylinder
Deduction of Coulomb's Law. Mechanical Force on a Charged Conductor. Electric Potential. Potential due to the Charged Spherical Conductor. Electric Potential and field Strength due to electric Dipole and Infinite line of Charge.
Potential of a uniformly charged circular disk – Problems. Atomic view of dielectric. PE of dipole in electric field. Polarization - Charge Density.
. Gauss Law in dielectrics. Relation between D,E and P. Dielectric Constant and susceptibility & relation between them.
Boundary conditions at the dielectric surface. Electric fields in cavities of dielectric. Needle shaped cavity and disc shaped cavity - Problems.
Capacity of concentric spheres. Cylindrical condenser, parallel plate capacitor with and without dielectric. Electric energy stored in a charged condenser.
Force between plates of a capacitor. Attracted disc electrometer. Construction and working of attracted disc electrometer, measurement of dielectric constant & potential difference. Problems.
Magnetic shell, Potential and filed due to magnetic shell-its equivalence with electric circuit & Magnetic shell. Magnetic induction B-and field H-permeability and susceptibility.-
Hall effect - Cyclotron, Sychrocyclotron and Synchrotron ,
Force on a current carrying conductor. Force and Torque on current loop. Biot-Savart law - B due to long straight wire.
B due to circular current loop and Solenoid - Problems.
Faradays laws - Lenz's Law - expression for induced emf - time varying magnetic fields - Betatron
Ballistic galvanometer - theory - Damping correction - Self and mutual inductance .
Coefficient of coupling - Calculation of self inductance of a long solenoid and toroid - Energy stored in magnetic field.
Principle of Transformer, construction, working, energy losses & efficiency - Problems.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2013-14

Department: **Physics** Paper: **IIIA (ELECTRICITY, MAGNITISM&ELECTRONICS)**

Class: **III B.Sc.** Semester**: V**

Topics to be covered
Gauss's Therom Proof Applications Electric Field due to infinite Conducting sheet of Charge, Field due to Uniformly Charged Sphere and Charged Cylinder. Deduction of Coulomb's Law.
Mechanical Force on a Charged Conductor. Electric Potential. Potential due to the Charged Spherical Conductor. Electric Field Strength from the electric Dipole and Infinite line of Charge. Potential of a uniformly charged circular disk – Problems.
Atomic view of dielectric. PE of dipole in electric field. Polarization. Charge Density. Gauss Law in dielectrics. Relation between D,E and P. Dielectric Constant and susceptibility & relation between them.
Boundary conditions at the dielectric surface. Electric fields in cavities of dielectric. Needle shaped cavity and disc shaped cavity-problems.
Capacity of concentric spheres. Cylindrical condenser, parallel plate capacitor with and without dielectric. Electric energy stored in a charged condenser.
Force between plates of a capacitor. Attracted disc electrometer. Construction and working of attracted disc electrometer, measurement of dielectric constant & potential difference. Problems.
Magnetic shell, Potential and filed due to magnetic shell-its equivalence with electric circuit & Magnetic shell. Magnetic induction B-and field H-permeability and susceptibility.-
Hall effect - Cyclotron, Sychrocyclotron and Synchrotron , Force on a current carrying conductor
Force and Torque on current loop. Biot-Savart law - B due to long straight wire, circular current loop and Solenoid - Problems.
Faradays laws - Lenz's Law - expression for induced emf - time varying magnetic fields - Betatron
Ballistic galvanometer - theory - Damping correction - Self and mutual inductance - Coefficient of coupling
Calculation of self inductance of a long solenoid and troid - Energy stored in magnetic field
Principle of Transformer, construction, working, energy losses & efficiency problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: PHYSICS Paper: IVA (ATOMIC&MOLICULAR PHYSICS AND QUANTUM MECHANICS) Class: III B.Sc., Semester: V

Topics
. **Atomic spectra:** Introduction – Drawbacks of Bohr's atomic model
Somerfield's elliptical orbits & relativistic correction (without derivation).
Somerfield's elliptical orbits & relativistic correction (without derivation).
Stern-Gerlach experiment. Vector atom model and quantum numbers associated with vector atom model
L-S and J-J couplings spectral terms. Selection rules—Intensity rules.
Normal Zeeman Effect-experiment Paschenback effect & Starck Effect.
Molecular spectroscopy: Types of Molecular spectra -- pure rotational energies and spectrum of diatomic molecule.
Determination of inter-nuclear distance. Vibrational energies and spectrum of diatomic molecules
Raman effect--stokes and anti stokes lines quantum theory of Raman Effect
Experimental arrangements for Raman Effect & its applications. problems
Quantum mechanics: Planck's radiation law (statement only)--Photoelectric effect--Einstein's explanation of photoelectric effect—Compton Effect & experimental verification.
Limitations of old quantum theory-De Broglie's Hypothesis. Wave length of matter waves—wave length associated with electron. Problems
Properties of matter waves. Concept of wave and group velocities. Davisson-Germer experiment. Double slit experiment,
standing debroglie's waves of electron in Bohr's orbit-Bohr's quantization of angular momentum and its application to hydrogen atom
Heisenberg's uncertainty relation for p and x-- its extension to energy and time. Gamma ray microscope-- diffraction at a slit--particle in a box. Problems. Position of electron in a Bohr orbit. Complementary principle of Bohr. Schrödinger's time dependent and time independent e equations—derivation

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: PHYSICS Paper: IVA (ATOMIC&MOLICULAR PHYSICS AND QUANTUM MECHANICS) Class: III B.Sc., Semester: V

Topics
Introduction –Bohr's Atomic theory-Drawbacks of Bohr's atomic model
Somerfield's elliptical orbits & relativistic correction. Stern-Gerald experiment Vector atom model and
Quantum numbers associated with vector atom model. L-S and J-J couplings spectral terms -- selection rules—Intensity rules.
Spectra of -alkali atoms--doublet fine structure-singlet and triplet fine structure in alkaline earth spectrum.
Normal Zeeman Effect-experiment Paschenback effect & Starck Effect. Problems
Types of Molecular spectra-- pure rotational energies and spectrum of diatomic molecules
Determination of inter-nuclear distance. Vibrational energies and spectrum of diatomic molecules
Raman effect--stokes and anti stokes lines quantum theory of Raman Effect
Experimental arrangements for Raman Effect & its applications. problems
Limitations of old quantum theory-De Broglie's Hypothesis. Wave length of matter waves—wave length associated with electron. Problems
Properties of matter waves. Concept of wave and group velocities. Davisson-Germer experiment. Double slit experiment,
Properties of matter waves. Concept of wave and group velocities. Davisson-Germer experiment. Double slit experiment,
Heisenberg's uncertainty relation for p and x-- its extension to energy and time. Gamma ray microscope-- diffraction at a slit--particle in a box. Problems Position of electron in a Bohr orbit. Complementary principle of Bohr. Schrödinger's time dependent and time independent e equations—derivation
Wave function properties & significance. Basic Postulates of quantum mechanics Operators, Eigen functions Eigen values expectation values. Particle in one and three dimensional boxes. Potential step-- potential barrier. problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: PHYSICS Paper: IVA (ATOMIC&MOLICULAR PHYSICS AND QUANTUM MECHANICS) Class: III B.Sc., Semester: V

Topics
Atomic spectra: Introduction – Drawbacks of Bohr's atomic model.
Somerfield's elliptical orbits & relativistic correction (without derivation).
Stern-Gerlach experiment. Vector atom model and quantum numbers associated with vector atom model.
L-S and J-J couplings spectral terms. Selection rules—Intensity rules.
Normal Zeeman Effect-experiment Paschenback effect & Starck Effect.
Molecular spectroscopy: Types of Molecular spectra -- pure rotational energies and spectrum of diatomic molecule.
Determination of inter-nuclear distance. Vibrational energies and spectrum of diatomic molecules
Raman effect, classical theory of Raman Effect, Experimental arrangements for Raman Effect & its applications.
Quantum mechanics: Compton Effect (quantitative) experimental verification. Matter waves: de Broglie's hypothesis
Wavelength of matter waves, wavelength associated with electron. Properties of matter waves.
Concept of wave and group velocities. Davisson-Germer experiment. Double slit experiment
Standing deBroglie's waves of electron in Bohr's orbit. Uncertainty principle: Heisenberg's uncertainty relation for p and x
Energy and time (E and t), Gamma ray microscope - Position of electron in a Bohr orbit - Complementary principle of Bohr
Schrödinger's time dependent and time independent wave equations—derivation. Wave function properties & significance. Basic Postulates of quantum mechanics Operators, Eigen functions Eigen values expectation values. Particle in one dimensional boxes. Potential step-- potential barrier. problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2015-16

Department: PHYSICS Paper: IVA (ATOMIC&MOLICULAR PHYSICS AND QUANTUM MECHANICS) Class: III B.Sc., Semester: V

Topics
Basic properties of nucleus-size, charge, mass, spin, magnetic dipole moment& electric quadruple moment. Binding energy of nucleus, deuteron binding energy.pp and np scattering
General concepts nuclear forces, Nuclear models-liquid drop model, shell model. Range of α particle--Geiger Nuttal law.
Gamow's theory of α-decay Geiger Nuttal law from Gamow's theory of α-decay.Beta ray spectrum-nuetrino hypothesis.,
Fermi's theory of beta decay (qualitative).Types of nuclear reactions, channels, nuclear reaction kinematics. Compound nucleus, direct reactions (concepts).
GM counter--proportional counter. Scintillation counter--Wilson cloud chamber & solid state detector. Crystalline nature of matter-crystal lattice, unit cell
Elements of symmetry.- crystal systems--Bravias lattices-- miller indices, Simple crystal structures (NaCl, CsCl, SC, BCC, FCC, Zinc blends and diamond)
diffraction of x-rays-- Bragg's law--Bragg's spectrometer. Laue method--powder diffraction method
Introduction to nanoparticles, metal nanocrystals**,** semiconductor nanoparticles, carbonclusters,
carbon nanotubes, quantum nanostructures nanodot, nanowire & quantum well. Fabrication of nanostructures. Types of bonding in crystals--characteristics of crystals with different bandings
Lattice energy of ionic crystal Determination of Madelung constant for NACL crystal. Calculation of Born coefficient & repulsive exponent--Born-Haber cycle.
Magnetic properties of materials-- Dia, Para and Ferro magnetic materials. Langevin's theory of ferromagnetism.
Weiss theory of Ferro magnetism.Idea of magnetic domains. Anti-ferro magnetism, & Ferromagnetism, ferrites & there applications
Basic experimental facts-zero resistance, effect of magnetic field,Meissner effect, persistent current,
Basic experimental facts-zero resistance, effect of magnetic field,Meissner effect, persistent current,
isotope effect, thermodynamic properties, specific heat, entropy. Type I & Type II superconductors.
Elements of BCS theory- cooper pairs. Applications, High temperature superconductors(general information)

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: PHYSICS Paper: IVA (ATOMIC&MOLICULAR PHYSICS AND QUANTUM MECHANICS) Class: III B.Sc., Semester: V

Topics
Introduction –Bohr's Atomic theory-Drawbacks of Bohr's atomic model
Somerfield's elliptical orbits & relativistic correction. Stern-Gerald experiment Vector atom model and
Quantum numbers associated with vector atom model. L-S and J-J couplings spectral terms --selection rules—Intensity rules
Spectra of -alkali atoms--doublet fine structure-singlet and triplet fine structure in alkaline earth spectrum
Normal Zeeman Effect-experiment Paschenback effect & Starck Effect. Problems
Types of Molecular spectra-- pure rotational energies and spectrum of diatomic molecules
Determination of inter-nuclear distance. Vibrational energies and spectrum of diatomic molecules
Raman effect--stokes and anti stokes lines quantum theory of Raman Effect
Experimental arrangements for Raman Effect & its applications. problems
Quantum mechanics: Planck's radiation law (statement only)--Photoelectric effect--Einstein's explanation of photoelectric effect—Compton Effect & experimental verification.
Limitations of old quantum theory-De Broglie's Hypothesis. Wave length of matter waves—wave length associated with electron. Problems
Properties of matter waves. Concept of wave and group velocities. Davisson-Germer experiment. Double slit experiment,
standing debroglie's waves of electron in Bohr's orbit-Bohr's quantization of angular momentum and its application to hydrogen atom
Heisenberg's uncertainty relation for p and x-- its extension to energy and time. Gamma ray microscope-- diffraction at a slit--particle in a box. Problems
Wave function properties & significance. Basic Postulates of quantum mechanics Operators, Eigen functions Eigen values expectation values. Particle in one and three dimensional boxes. Potential step-- potential barrier. problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2013-14

Department: PHYSICS Paper: IVA (ATOMIC&MOLICULAR PHYSICS AND QUANTUM MECHANICS) Class: III B.Sc., Semester: V

Topics
Introduction –Bohr's Atomic theory-Drawbacks of Bohr's atomic model
Somerfield's elliptical orbits & relativistic correction. Stern-Gerald experiment Vector atom model and
Quantum numbers associated with vector atom model. L-S and J-J couplings spectral terms --selection rules—Intensity rules
Spectra of -alkali atoms--doublet fine structure-singlet and triplet fine structure in alkaline earth spectrum.
Normal Zeeman Effect-experiment Paschenback effect & Starck Effect. Problems
Types of Molecular spectra-- pure rotational energies and spectrum of diatomic molecules
Determination of inter-nuclear distance. Vibrational energies and spectrum of diatomic molecules
Raman effect--stokes and anti stokes lines quantum theory of Raman Effect
Experimental arrangements for Raman Effect & its applications. problems
Quantum mechanics: Planck's radiation law (statement only)--Photoelectric effect--Einstein's explanation of photoelectric effect—Compton Effect & experimental verification
Limitations of old quantum theory-De Broglie's Hypothesis. Wave length of matter waves—wave length associated with electron. Problems
Properties of matter waves. Concept of wave and group velocities. Davisson-Germer experiment. Double slit experiment,
Heisenberg's uncertainty relation for p and x-- its extension to energy and time. Gamma ray microscope-- diffraction at a slit--particle in a box. Problems
Wave function properties & significance. Basic Postulates of quantum mechanics Operators, Eigen functions Eigen values expectation values.
Particle in one and three dimensional boxes. Potential step-- potential barrier. problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: **Physics** Paper :IVB (MICROPROCESSERS&MICRO CONTROLLERS)

Class:IIIB.Sc. Semester:VI

Topics
Introduction to microcontrollers,Architecher of embedded system, applications and purposes , challenges and designs.
Elemental discriptions of embedded processors and microcontrollers.
Microprocessors: 8085Microprocessor, its pin diagram,concept of Data bus and address bus.
Microprocessors: 8085Microprocessor, its pin diagram,concept of Data bus and address bus.
Hardware and software interrupts. 8051 microcontroller: Introduction , Block diagram . Assembly language programming, program counter.
ROM memory, data types and directives, flag Bits,PSW Register Arthmatic and logical instructions. Jump, loop,call instructions
Timers: programming of 8051 timers, counter programming.
Embedded system programming, structure of programming, Infinite loop, compiling and Debugging.
Embedded system design and development: Embedded system development environment.
File type generated after cross compilation, dissembler, simulator and debugging
Embedded product life cycle : Embedded product development life cycle

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: **Physics** Paper :IVB (MICROPROCESSERS&MICRO CONTROLLERS)

Class:IIIB.Sc. Semester:VI

Topics
Introduction to microcontrollers,Architecher of embedded system, applications and purposes , challenges and designs.
Elemental discriptions of embedded processors and microcontrollers.
Microprocessors: 8085Microprocessor, its pin diagram,concept of Data bus and address bus.
8085 programming, instruction classification, stacks and its implementation,
8051 microcontroller: Introduction , Block diagram . Assembly language programming, program counter
ROM memory, data types and directives, flag Bits,PSW Register Arthmatic and logical instructions. Jump, loop,call instructions
Timers: programming of 8051 timers, counter programming.
Embedded system programming, structure of programming, Infinite loop, compiling and Debugging.
Embedded system design and development: Embedded system development environment.
File type generated after cross compilation, dissembler, simulator and debugging
Embedded product life cycle : Embedded product development life cycle

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: Physics Paper: **V** B (computational methods and programming)

Class: **III** BSc Semester: **VI**

Topics
Fundamentals of C language:C character set- Identifiers and keywords-constants-variables-data types-declarations of variables-declaration of storage classes.
Defining symbolic constants –assigenment statement.Operators:arithmetic operators -relational operators-logical operators
Assignment operators-increment and decrement operators-conditional operators-Expressions and I/O statements :arithmetic expressions-precedence of arithmetic operators.
Mathematical (library) functios –data input and out put-scanf-printf simple programs
Decession control statements: If-Else statements-Switch statements-The operators-GO TO.
Iterative statements (or) Loops :While,Do-While,For statements-Break and Continue Statement.
Arrays:one dimentional and two dimentional arrays-initialisation-type declaration-inputting and out putting of data for arrays-programs of matrices addition, multiplication.
User defined functions: the form of C functions-return values and their types-Calling a Function-category of functions. Recursion-ANSI C functions-function declaration. Scope and life time of variables in functions .
Linear equations solution of algebra and transcendental equations-Rhapson method-basic principles-formulae algorithms.
Interpolations: concept of linear interpolation-finite differences
Newton's and Lagrange's interpolation formulae-priciples and algorithms
Numerical differentiation:numerical differentiation algorithm for evalution of first order derivatives using formulae based on Taylor's series.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: Physics Paper: **V** B (computational methods and programming)

Class: **III** BSc Semester: **VI**

Topics
Fundamentals of C language:C character set- Identifiers and keywords-constants-variables-data types-declarations of variables-declaration of storage classes.
Defining symbolic constants –assigenment statement.Operators:arithmetic operators -relational operators-logical operators
Assignment operators-increment and decrement operators-conditional operators-Expressions and I/O statements :arithmetic expressions-precedence of arithmetic operators.
Mathematical (library) functios –data input and out put-scanf-printf simple programs.
Decession control statements: If-Else statements-Switch statements-The operators-GO TO.
Cat1 examinations- Iterative statements (or) Loops :While,Do-While,For statements-Break and Continue Statement.
Arrays:one dimentional and two dimentional arrays-initialisation-type declaration-inputting and out putting of data for arrays-programs of matrices addition, multiplication
User defined functions: the form of C functions-return values and their types-Calling a Function-category of functions. Recursion-ANSI C functions-function declaration. Scope and life time of variables in functions .
Linear equations solution of algebra and transcendental equations-Rhapson method-basic principles-formulae algorithms.
Interpolations: concept of linear interpolation-finite differences
Newton’s and Lagrange’s interpolation formulae-priciples and algorithms.
Numerical differentiation:numerical differentiation algorithm for evalution of first order derivatives using formulae based on Taylor’s series.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: Physics Paper: VI B (Electronic Instrumentation)

Class: III B.Sc Semester:VI

Topics
Basic of measurements: Multimeter , principles of measurement of dc voltage and dc currents
ac current and resistance, specifications of multimeter and their significance
Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedence and sensitivity,
principles of voltage measurement (block diagram only), specification of an electronic voltmeter/ multimeter and their significance.
CRO :Block diagram of basic CRO, construction of CRT
Applications of CRO: Measurement of voltage dc and ac, frequency,
digital storage oscilloscope: block diagram, principle and working. Digital Multimeter: Block diagram
working, frequency measurement using universal counter, frequency counter.
Digital instruments: Principle and working of digital instruments,
working principle of digital voltmeter.
Signal generators: Block diagram, explanation, specifications of low frequency signal generators
pulse generator, function generator-working,
Distortion factor meter, wave analysis.
Bridges: Block diagram, working of basic LCR bridge - working.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: Physics Paper: VI B (Electronic Instrumentation)

Class: III B.Sc Semester: VI

Topics
Basic of measurements: Multimeter , principles of measurement of dc voltage and dc currents
ac current and resistance, specifications of multimeter and their significance
Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedence and sensitivity,
principles of voltage measurement (block diagram only), specification of an electronic voltmeter/ multimeter and their significance.
CRO :Block diagram of basic CRO, construction of CRT
Applications of CRO: Measurement of voltage dc and ac, frequency,
digital storage oscilloscope: block diagram, principle and working. Digital Multimeter: Block diagram
working, frequency measurement using universal counter, frequency counter.
Digital instruments: Principle and working of digital instruments,
working principle of digital voltmeter.
Signal generators: Block diagram, explanation, specifications of low frequency signal generators
pulse generator, function generator-working,
Distortion factor meter, wave analysis.
Bridges: Block diagram, working of basic LCR bridge - working.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: Physics Paper: **V** B (computational methods and programming)

Class: **III** BSc Semester: **VI**

Topics
Fundamentals of C language:C character set- Identifiers and keywords-constants-variables-data types-declarations of variables-declaration of storage classes.
Defining symbolic constants –assigenment statement.Operators:arithmetic operators -relational operators-logical operators
Assignment operators-increment and decrement operators-conditional operators-Expressions and I/O statements :arithmetic expressions-precedence of arithmetic operators.
Mathematical (library) functios –data input and out put-scanf-printf simple programs
Decession control statements: If-Else statements-Switch statements-The operators-GO TO.
Iterative statements (or) Loops :While,Do-While,For statements-Break and Continue Statement.
Arrays:one dimentional and two dimentional arrays-initialisation-type declaration-inputting and out putting of data for arrays-programs of matrices addition, multiplication.
User defined functions: the form of C functions-return values and their types-Calling a Function-category of functions. Recursion-ANSI C functions-function declaration. Scope and life time of variables in functions .
Linear equations solution of algebra and transcendental equations-Rhapson method-basic principles-formulae algorithms.
Interpolations: concept of linear interpolation-finite differences
Newton’s and Lagrange’s interpolation formulae-priciples and algorithms
Numerical differentiation:numerical differentiation algorithm for evalution of first order derivatives using formulae based on Taylor’s series.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: Physics Paper: **V** B (computational methods and programming)

Class: **III** BSc Semester: **VI**

Topics
Fundamentals of C language:C character set- Identifiers and keywords-constants-variables-data types-declarations of variables-declaration of storage classes.
Defining symbolic constants –assigenment statement.Operators:arithmetic operators -relational operators-logical operators
Assignment operators-increment and decrement operators-conditional operators-Expressions and I/O statements :arithmetic expressions-precedence of arithmetic operators.
Mathematical (library) functios –data input and out put-scanf-printf simple programs.
Decession control statements: If-Else statements-Switch statements-The operators-GO TO.
Cat1 examinations- Iterative statements (or) Loops :While,Do-While,For statements-Break and Continue Statement.
Arrays:one dimentional and two dimentional arrays-initialisation-type declaration-inputting and out putting of data for arrays-programs of matrices addition, multiplication
User defined functions: the form of C functions-return values and their types-Calling a Function-category of functions. Recursion-ANSI C functions-function declaration. Scope and life time of variables in functions .
Linear equations solution of algebra and transcendental equations-Rhapson method-basic principles-formulae algorithms.
Interpolations: concept of linear interpolation-finite differences
Newton’s and Lagrange’s interpolation formulae-priciples and algorithms.
Numerical differentiation:numerical differentiation algorithm for evalution of first order derivatives using formulae based on Taylor’s series.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: Physics Paper: VI B (Electronic Instrumentation)

Class: III B.Sc Semester:VI

Topics
Basic of measurements: Multimeter , principles of measurement of dc voltage and dc currents
ac current and resistance, specifications of multimeter and their significance
Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedence and sensitivity,
principles of voltage measurement (block diagram only), specification of an electronic voltmeter/ multimeter and their significance.
CRO :Block diagram of basic CRO, construction of CRT
Applications of CRO: Measurement of voltage dc and ac, frequency,
digital storage oscilloscope: block diagram, principle and working. Digital Multimeter: Block diagram
working, frequency measurement using universal counter, frequency counter.
Digital instruments: Principle and working of digital instruments,
working principle of digital voltmeter.
Signal generators: Block diagram, explanation, specifications of low frequency signal generators
pulse generator, function generator-working,
Distortion factor meter, wave analysis.
Bridges: Block diagram, working of basic LCR bridge - working.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: Physics Paper: VI B (Electronic Instrumentation)

Class: III B.Sc Semester: VI

Topics
Basic of measurements: Multimeter , principles of measurement of dc voltage and dc currents
ac current and resistance, specifications of multimeter and their significance
Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedence and sensitivity,
principles of voltage measurement (block diagram only), specification of an electronic voltmeter/ multimeter and their significance.
CRO :Block diagram of basic CRO, construction of CRT
Applications of CRO: Measurement of voltage dc and ac, frequency,
digital storage oscilloscope: block diagram, principle and working. Digital Multimeter: Block diagram
working, frequency measurement using universal counter, frequency counter.
Digital instruments: Principle and working of digital instruments,
working principle of digital voltmeter.
Signal generators: Block diagram, explanation, specifications of low frequency signal generators
pulse generator, function generator-working,
Distortion factor meter, wave analysis.
Bridges: Block diagram, working of basic LCR bridge - working.

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2018-19

Department: PHYSICS Paper :IIIB (ANALOG & DIGITAL ELECTRONICS) Class: III B.Sc., Semester: VI

Topics
FET-constructions, working, characteristics and uses, MOSFET
MOSFET- enhancement MOSFET, construction and working
Drain characteristics of MOSFET, applications of MOSFET
Photo electric devices; structure and operation, characteristics, application of LDR, LED
Operational amplifiers :Charactersticsof ideal and practical Op- Amp (IC 741),Basic diferntial amplifiers,
Op-Amp supply voltage, IC identification, Internal blocks of Op-Amp
CMRR,slew rate, concept of virtual ground. Applications of Op-Amp; Op-Amp as Inverting amplifier, Non-inverting amplifier
Voltage follower, summing amplifier, difference amplifier , comparator, integrator, differentiator , Data processing circuits; Multiplexers, De- Multiplexers, encoders, decoders,
Characteristics for Digital IC'S – RTL, DTL, TTL,(NAND & NOR Gates) IC 555 Timer – Its pin diagram, internal architecture, Application as astable multi vibrator and mono stable multi vibrator
Sequential digital circuits; Flip-Flops, RS- Clocked SR, JD, D,T, Master- Slave, Flip-Flop
Code Converters: Design of code converter, BCD to 7 segment, Binary /BCD to gray, gray to binary /BCD
Elements of BCS theory- cooper pairs. Applications, High temperature superconductors(general information)

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2017-18

Department: PHYSICS Paper :IIIB (ANALOG & DIGITAL ELECTRONICS) Class: III B.Sc., Semester: VI

Topics
FET-constructions, working, characteristics and uses, MOSFET
MOSFET- enhancement MOSFET, construction and working
Drain characteristics of MOSFET, applications of MOSFET
Photo electric devices; structure and operation, characteristics, application of LDR, LED
Operational amplifiers :Charactersticsof ideal and practical Op- Amp (IC 741),Basic diferntial amplifiers, Op-Amp supply voltage, IC identification, Internal blocks of Op-Amp
PONGAL HOLIDAYS
CMRR,slew rate, concept of virtual ground.
Applications of Op-Amp; Op-Amp as Inverting amplifier, Non-inverting amplifier
Voltage follower, summing amplifier, difference amplifier , comparator, integrator, differentiator , Data processing circuits; Multiplexers, De- Multiplexers, encoders, decoders
Characteristics for Digital IC'S – RTL, DTL, TTL,(NAND & NOR Gates) IC 555 Timer – Its pin diagram, internal architecture, Application as astable multi vibrator and mono stable multi vibrator
Sequential digital circuits; Flip-Flops, RS- Clocked SR, JD, D,T, Master- Slave, Flip-Flop
Code Converters: Design of code converter, BCD to 7 segment, Binary /BCD to gray, gray to binary /BCD
Elements of BCS theory- cooper pairs. Applications, High temperature superconductors(general information)

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: Physics Paper: (IIIB ELECTRICITY, MAGNITISM&ELECTRONICS)

Class: III B.Sc Semester: VI

Topics
Growth and decay of current in LR,CR circuits and LCR circuits
Critical damping. Alternating Current, Relation between V and I In pure R C and L
Vector diagrams , Power in ac circuits, L C R Series& parallel resonant circuit, Band width,
Q factor , AC&DC motors-single phase, three phase(basics only).Power factor –wattless current.
Basic laws of Electricity and Magnetism, Displacement current, Maxwell's equations in differential form,
Maxwell's Wave Equation, Plane e m waves, Transverse nature of em waves ,Poynting Theorem.
Production of em waves, Formation of electron energy bands in solids,
Band theory of solids, and classification of solids in terms of forbidden energy gaps.
Intrinsic& extrinsic Semi conductors, Fermi level, Continuity equation, PN junction diode,
Zener diode characterstics & its applications as voltage regulator Half wave and full wave rectifiers and filters,
Ripple factor(qualitative), PNP & NPN Transistors, Current components, CB,CE,CC configurations, H- parameters
Determination from transistor characteristics Transistor as an amplifier, Concept of Feedback,
Barkhausen condition, RC Coupled amplifier Phase shift oscillator (qualitative), Binary number system, converting binary to decimal & vice versa.
Binary addition & subtraction. Hexa-decimal number system. Conversion from binary to hexadecimal –vice versa& Decimal to Hexadecimal-vice versa.
Logic gates using discrete components Universal gates, Truth tables, Exclusive OR gate,
Half and full Adders, Parallel Adder circuits, Flip Flops, RS Flip Flop. Demorgan's theorems proof problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2015-16

Department: Physics Paper: (IIIB ELECTRICITY, MAGNITISM&ELECTRONICS)

Class: III B.Sc Semester: VI

Topics
Growth and decay of current in LR,CR circuits and LCR circuits
Critical damping. Alternating Current, Relation between V and I In pure R, C and L
Vector diagrams , Power in ac circuits, L C R Series& parallel resonant circuit, Band width,
Q factor ,.Power in AC circuit, Power factor –wattless current.
Basic laws of Electricity and Magnetism, Displacement current, Maxwell's equations in differential form,
Maxwell's Wave Equation, Plane e m waves, Transverse nature of em waves ,Poynting Theorem.
Production of em waves(Hertz experiment)
PN junction diode, Zener diode, characteristics and itss applications as a voltage regulator
Half wave and full wave rectifiers, Ripple factor(qualitative),
PNP & NPN Transistors, Current components, CB,CE,CC configurations, H-parameters,
Transistor as an amplifier, Digital principles: binary number system, conversion of binary decimal and vice versa
Binary addition & subtraction.(1's and 2's Complementary methods) Hexa-decimal number system. Conversion from binary to hexadecimal –vice versa&
Decimal to Hexadecimal-vice versa., Logic gates OR, AND and NOT gates-truth tables
Realisation of these Logic gates using discrete components,NAND and NOR gates as Universal gates, ,
Exclusive OR gate, Demorgan's theorems statement and proof
Half and full Adders

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: Physics Paper: (IIIB ELECTRICITY, MAGNITISM&ELECTRONICS)

Class: III B.Sc Semester: VI

Topics
Growth and decay of current in LR,CR circuits and LCR circuits
Critical damping. Alternating Current, Relation between V and I In pure R C and L
Vector diagrams , Power in ac circuits, L C R Series& parallel resonant circuit, Band width,
Q factor , AC&DC motors-single phase, three phase(basics only).Power factor – wattless current.
Basic laws of Electricity and Magnetism, Displacement current, Maxwell's equations in differential form,
Maxwell's Wave Equation, Plane e m waves, Transverse nature of em waves ,Poynting Theorem.
Production of em waves, Formation of electron energy bands in solids,
Band theory of solids, and classification of solids in terms of forbidden energy gaps.
Intrinsic& extrinsic Semi conductors, Fermi level, Continuity equation, PN junction diode,
Zener diode characterstics& its applications as voltage regulator Half wave and full wave rectifiers and filters,
Ripple factor(qualitative), PNP & NPN Transistors, Current components, CB,CE,CC configurations, H- parameters
Determination from transistor characteristics Transistor as an amplifier, Concept of Feedback,
Barkhausen condition, RC Coupled amplifier Phase shift oscillator (qualitative), Binary number system, converting binary to decimal & vice versa.
Binary addition & subtraction. Hexa-decimal number system. Conversion from binary to hexadecimal –vice versa& Decimal to Hexadecimal-vice versa.
Logic gates using discrete components Universal gates, Truth tables, Exclusive OR gate,
Half and full Adders, Parallel Adder circuits, Flip Flops, RS Flip Flop. Demorgan's theorems proof problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2013-14

Department: Physics Paper: (IIIB ELECTRICITY, MAGNITISM&ELECTRONICS)

Class: III B.Sc Semester: VI

Topics
Growth and decay of current in LR,CR circuits and LCR circuits
Critical damping. Alternating Current, Relation between V and I In pure R , C and L
Vector diagrams , Power in ac circuits, L C R Series& parallel resonant circuit, Band width
Q factor , AC&DC motors-single phase, three phase(basics only).Power factor – wattless current.
Basic laws of Electricity and Magnetism, Displacement current, Maxwell's equations in differential form
Maxwell's Wave Equation, Plane e m waves, Transverse nature of em waves ,Poynting Theorem.
Production of em waves, Formation of electron energy bands in solids
Band theory of solids, and classification of solids in terms of forbidden energy gaps.
Intrinsic& extrinsic Semi conductors, Fermi level, Continuity equation, PN junction diode
Zener diode characterstics& its applications as voltage regulator Half wave and full wave rectifiers and filters
Ripple factor(qualitative), PNP & NPN Transistors, Current components, CB,CE,CC configurations, H- parameters
Determination from transistor characteristics, Transistor as an amplifier, Concept of Feedback,
Barkhausen condition, RC Coupled amplifier, Phase shift oscillator (qualitative), Binary number system, converting binary to decimal & vice versa.
Binary addition & subtraction. Hexa-decimal number system. Conversion from binary to hexadecimal –vice versa & Decimal to Hexadecimal-vice versa.
Logic gates using discrete components, Universal gates, Truth tables, Exclusive OR gate,
Half and full Adders, Parallel Adder circuits, Flip Flops, RS Flip Flop. Demorgan's theorems proof problems

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2013-14

Department: PHYSICS Paper: IV B(NUCLEARPHYSICS&SOLIDSTATE PHYSICS)

Class: III BSC Semester: VI

Topics
Basic properties of nucleus-size, charge, mass, spin, magnetic dipole moment& electric quadruple moment.
Binding energy of nucleus, deuteron binding energy.pp and np scattering
General concepts nuclear forces, Nuclear models-liquid drop model, shell model. Range of α particle--Geiger Nuttal law.
Fermi's theory of beta decay (qualitative).Types of nuclear reactions, channels, nuclear reaction kinematics. Compound nucleus, direct reactions (concepts).
GM counter--proportional counter. Scintillation counter--Wilson cloud chamber & solid state detector.
Crystalline nature of matter-crystal lattice, unit cell, Elements of symmetry.- crystal systems--Bravias lattices-- miller indices
Simple crystal structures (NaCl, CsCl, SC, BCC, FCC, Zinc blends and diamond) diffraction of x-rays-- Bragg's law--Bragg's spectrometer. Laue method--powder diffraction method
nanodot, nanowire & quantum well. Fabrication of nanostructures. Types of bonding in crystals--characteristics of crystals with different bandings Carbon nanotubes, quantum nanostructures
Lattice energy of ionic crystal Determination of Madelung constant for NACL crystal. Calculation of Born coefficient & repulsive exponent--Born-Haber cycle
Magnetic properties of materials-- Dia, Para and Ferro magnetic materials. Langevin's theory of ferromagnetism. Weiss theory of Ferro magnetism.Idea of magnetic domains.
Anti-ferro magnetism, & Ferromagnetism, ferrites & there applications. Basic experimental facts-zero resistance, effect of magnetic field,
Meissner effect, persistent current, isotope effect, thermodynamic properties, specific heat, entropy. Type I & Type II superconductors
Elements of BCS theory- cooper pairs. Applications, High temperature superconductors(general information)

DANTULURI NARAYANA RAJU COLLEGE(AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2014-15

Department: PHYSICS Paper: IV B(NUCLEARPHYSICS&SOLIDSTATE PHYSICS)

Class: III BSC Semester: VI

Topics
Basic properties of nucleus-size, charge, mass, spin, magnetic dipole moment& electric quadruple moment.
Binding energy of nucleus, deuteron binding energy.pp and np scattering
Basic properties of nucleus-size, charge, mass, spin, magnetic dipole moment& electric quadruple moment.
Binding energy of nucleus, deuteron binding energy.pp and np scattering
General concepts nuclear forces, Nuclear models-liquid drop model, shell model. Range of α particle--Geiger Nuttal law.
Gamow's theory of α-decay Geiger Nuttal law from Gamow's theory of α-decay.Beta ray spectrum-nuetrino hypothesis.,
Fermi's theory of beta decay (qualitative).Types of nuclear reactions, channels, nuclear reaction kinematics. Compound nucleus, direct reactions (concepts).GM counter--proportional counter. Scintillation counter--Wilson cloud chamber & solid state detector.
Crystalline nature of matter-crystal lattice, unit cell, Elements of symmetry.- crystal systems--Bravias lattices-- miller indices
Simple crystal structures (NaCl, CsCl, SC, BCC, FCC, Zinc blends and diamond) diffraction of x-rays-- Bragg's law--Bragg's spectrometer. Laue method--powder diffraction method
Introduction to nanoparticles, metal nanocrystals**,** semiconductor nanoparticles, carbonclusters, carbon nanotubes, quantum nanostructures nanodot, nanowire & quantum well. Fabrication of nanostructures. Types of bonding in crystals--characteristics of crystals with different bandings
Lattice energy of ionic crystal Determination of Madelung constant for NACL crystal. Calculation of Born coefficient & repulsive exponent--Born-Haber cycle. Magnetic properties of materials-- Dia, Para and Ferro magnetic materials. Langevin's theory of ferromagnetism. Weiss theory of Ferro magnetism.Idea of magnetic domains.
Meissner effect, persistent current, isotope effect, thermodynamic properties, specific heat, entropy. Type I & Type II superconductors.

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2015-16

Department: PHYSICS Paper: IV B (NUCLEARPHYSICS&SOLIDSTATE PHYSICS)

Class: III BSC Semester: VI

Topics
Basic properties of nucleus-size, charge, mass, spin, magnetic dipole moment& electric quadruple moment.
Binding energy of nucleus, deuteron binding energy.pp and np scattering
General concepts nuclear forces, Nuclear models-liquid drop model, shell model. Range of α particle--Geiger Nuttal law
Gamow's theory of α-decay Geiger Nuttal law from Gamow's theory of α-decay.Beta ray spectrum-nuetrino hypothesis.,
Fermi's theory of beta decay (qualitative).Types of nuclear reactions, channels, nuclear reaction kinematics. Compound nucleus, direct reactions (concepts).
GM counter--proportional counter. Scintillation counter--Wilson cloud chamber & solid state detector. Crystalline nature of matter-crystal lattice, unit cell, Elements of symmetry.- crystal systems--Bravias lattices-- miller indices
Simple crystal structures (NaCl, CsCl, SC, BCC, FCC, Zinc blends and diamond) diffraction of x-rays-- Bragg's law--Bragg's spectrometer. Laue method--powder diffraction method
Introduction to nanoparticles, metal nanocrystals**,** semiconductor nanoparticles, carbonclusters,
carbon nanotubes, quantum nanostructures nanodot, nanowire & quantum well. Fabrication of nanostructures. Types of bonding in crystals--characteristics of crystals with different bandings
Lattice energy of ionic crystal Determination of Madelung constant for NACL crystal. Calculation of Born coefficient & repulsive exponent--Born-Haber cycle.
Magnetic properties of materials-- Dia, Para and Ferro magnetic materials. Langevin's theory of ferromagnetism. Weiss theory of Ferro magnetism.Idea of magnetic domains.
Anti-ferro magnetism, & Ferromagnetism, ferrites & there applications. Basic experimental facts-zero resistance, effect of magnetic field,

DANTULURI NARAYANA RAJU COLLEGE (AUTONOMOUS)

(A College with Potential for Excellence)

Bhimavaram, W.G.Dist, A.P

Syllabus for the Academic Year 2016-17

Department: PHYSICS Paper: IV B (NUCLEARPHYSICS&SOLIDSTATE PHYSICS)

Class: III BSC Semester: VI

Topics
Basic properties of nucleus-size, charge, mass, spin, magnetic dipole moment& electric quadruple moment.
Binding energy of nucleus, deuteron binding energy.pp and np scattering
General concepts nuclear forces, Nuclear models-liquid drop model, shell model. Range of α particle--Geiger Nuttal law
Gamow's theory of α-decay Geiger Nuttal law from Gamow's theory of α-decay.Beta ray spectrum-nuetrino hypothesis.,
Fermi's theory of beta decay (qualitative).Types of nuclear reactions, channels, nuclear reaction kinematics. Compound nucleus, direct reactions (concepts).
GM counter--proportional counter. Scintillation counter--Wilson cloud chamber & solid state detector. Crystalline nature of matter-crystal lattice, unit cell, Elements of symmetry.- crystal systems--Bravias lattices-- miller indices
Simple crystal structures (NaCl, CsCl, SC, BCC, FCC, Zinc blends and diamond) diffraction of x-rays-- Bragg's law--Bragg's spectrometer. Laue method--powder diffraction method
Introduction to nanoparticles, metal nanocrystals**,** semiconductor nanoparticles, carbonclusters,
carbon nanotubes, quantum nanostructures nanodot, nanowire & quantum well. Fabrication of nanostructures. Types of bonding in crystals--characteristics of crystals with different bandings
Lattice energy of ionic crystal Determination of Madelung constant for NACL crystal. Calculation of Born coefficient & repulsive exponent--Born-Haber cycle.
Magnetic properties of materials-- Dia, Para and Ferro magnetic materials. Langevin's theory of ferromagnetism. Weiss theory of Ferro magnetism.Idea of magnetic domains.
Anti-ferro magnetism, & Ferromagnetism, ferrites & there applications. Basic experimental facts-zero resistance, effect of magnetic field,