

Krantiguru Shyamji Krishna Verma

***Kachchh University***

Mundra Road

**BHUJ : 370 001**



**SYLLABUS (CBCS)**

**B. Sc. Semester V & VI**

**PHYSICS**

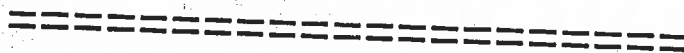
CODE : MJPHY - 501, 502, 503, 504, 505, 506

MJPHY - 601, 602, 603, 604, 605, 606

MNPHY - 507, 508, 509, 510

MNPHY - 607, 608

**With effect from June 2025**



**K S K V Kachchh University**  
**B. Sc. (Physics) NEP Syllabus**  
**(In force from June 2025)**

Semester - V

**MJPHY – 501 Classical and Quantum Mechanics**

**Unit-I**

**Classical Mechanics**

**Lagrangian Formulation** : Constraints; Generalised coordinates; D'Alembert's principle; Lagrange's equations; A general equation for kinetic energy; Symmetries and laws of conservation; Cyclic or ignorable coordinates; Velocity-dependent potential of electromagnetic field.

**Ref.** : Introduction to Classical Mechanics by R.G. Takwale & P.S. Puranik  
(Chapter 8, Art. 8.1 to 8.8)

**Motion of a rigid body**: Angular momentum and kinetic energy; The inertia tensor; Euler's equations of motion; Torque-free motion.

**Ref.**: Introduction to Classical Mechanics by R.G. Takwale & P.S. Puranik  
(Chapter 10, Art. 10.2 to 10.5)

**Unit-II**

**Classical Mechanics**

**Variational Principle : Lagrange's and Hamilton's Equations** : Configuration space; Some techniques of calculus of variation; Applications of variational principle; Hamilton's principle; Hamilton's equations of motion; Some applications of the Hamiltonian formulation; Phase space; Comments on the Hamiltonian formulation.

**Ref.** : Introduction to Classical Mechanics by R.G. Takwale & P.S. Puranik  
(Chapter 11, Art. 11.1 to 11.4 & 11.10 to 11.13)

**Unit III**

**Quantum Mechanics**

**General Formalism of Quantum Mechanics**: Linear Vector Space; Linear Operator; Eigenfunctions and Eigenvalues; Hermitian Operator; Postulates of Quantum Mechanics; Simultaneous Measurability of Observables; General Uncertainty Relation; Dirac's Notation

**Ref.** : Quantum Mechanics (Second Ed.) by G. Aruldas  
(Chapter 3, Art. 3.1 to 3.8)



## MJPHY - 502 PRACTICALS

- (1) Acceleration due to Gravity by Kater's Pendulum (Variable Knife Edges)
- (2)  $e/k$  by Power Transistor
- (3) Stefan's Constant of Radiation
- (4) Feby Parot Etalon – Determination of thickness of air film
- (5) Michelson Interferometer – to determine the wavelength of light
- (6) To Study the Edser – Butler Bands
- (7) Eigenvalues and Eigenfunctions of a Matrix
- (8) Digital to Analog converter using IC741



# MJPHY – 503 Molecular Spectroscopy, Solid State Physics

## Unit-I

### Molecular Spectroscopy

**Vibrational Rotational Spectra :** Salient features of vibrational rotational spectra; Molecule as a harmonic oscillator; Molecule as anharmonic oscillator; Vibrational frequency and force constant for anharmonic oscillator; Isotope effect on vibrational levels; Molecule as vibrating rotator- Fine structure of infra red bands; Thermal distribution of vibrational and rotational levels.

**Ref. :** Atomic And Molecular Spectra by Raj Kumar  
(Chapter 19, Art. 1 to 6 and 8)

**Raman Spectra :** Nature of Raman spectra; Experimental arrangement of Raman spectra; Classical theory of Raman effect; Quantum theory of Raman effect; Raman spectra and molecular structure; Infra red spectra versus Raman spectra.

**Ref.:** Atomic And Molecular Spectra by Raj Kumar  
(Chapter 20, Art. 1 to 6)

## Unit-II

### Solid State Physics

**Atomic Cohesion and crystal binding :** Cohesion of atoms; Primary bonds; Covalent bond; The metallic bond; The Ionic bond; Secondary bonds; The Van-der Waals bond; The hydrogen bond; The Cohesive energy; Ionic crystals; The Repulsive overlap energy; Noble gas crystal; Atomic radii versus lattice constant; Elastic constants of crystals; Elastic stress; Elastic strain; Dilation; Elastic compliance and stiffness constant; Elastic energy density; Application to cubic crystals; Bulk modulus and compressibility; Elastic waves in cubic crystal; Propagation of waves in the [100] direction.

**Ref.:** Elements of Solid State Physics by J. P. Srivastava  
(Chapter 2, Art. 2.1 to 2.8.1)

## Unit-III

### Solid State Physics

**Free Electron Theory of metals :** Drude model; Electrical conductivity of metals; Thermal conductivity of metals; The Fermi-Dirac distribution function; The Sommerfeld model; The Density of states; The Free Electron gas at 0 K; Energy of Electron Gas at 0 K; The Electron Heat Capacity; The Sommerfeld theory of Electric conduction in metals; The Hall Coefficient ( $R_H$ ); Matthiessen's Rule; Thermoelectric



Effects; Thermoelectric power; The Thomson Effect; The Peltier Effect; Kelvin (Thomson) Relations.

**Ref.:** Elements of Solid State Physics by J. P. Srivastava  
(Chapter 6, Art. 6.1, 6.3 to 6.8.4)

### **MJPHY - 504 PRACTICALS**

- (1) Hysteresis by Magnetometer
- (2) Comparison of Capacities by Mixture Method
- (3) Measurement of Phase and Frequency by C.R.O.
- (4) Hartley Oscillator – Measurement of Frequency by C.R.O.
- (5) Series Resonance – Determination of Band Width and Q – Factor
- (6) Characteristics of GM Tube
- (7) To Design a Logic Circuit
- (8) OP-amp as adder/subtractor.





## Unit-III

### Fourier Series

Application of Fourier series (with example), Average value of a function (with examples 1 and 2), Fourier coefficients (with examples 1 and 2), Dirichlet conditions (with example), Complex form of Fourier series (with example), Other intervals (with example), Even and odd functions (with example)

Chapter 7 Topic 3 to 9

Book: MATHEMATICAL METHODS IN THE PHYSICAL SCIENCES Third Edition MARY L. BOAS  
DePaul University

## MJPHY - 506 PRACTICALS

Project Work / Field Visit

### PATTERN OF QUESTION PAPER FOR SEMESTER-END EXAMS

#### THEORY

In each theory paper there will be FOUR Questions 10 Marks. (Q.1 to Q.3), one question from every unit, which consist 2 questions of same weightage and student has to attempt any one. A Q.4 will be of 12 Objective/ 1 marks questions, 4 from each unit. Student has to attempt any 10. Duration of the exam: 2 Hrs 15 Min. Passing standard: 16 Marks out of 40 Marks.

The structure for each question is as under:

**Q.1 to Q.3 Descriptive type (with internal option) 10 Marks**

*The types of questions are varied, like: Derivations,  
Short notes, Problems etc.*

**Q.4 Objective type 10 Marks**

*The types of questions are varied, like: One line answers,  
Two line answers, Definitions, Reasoning, Drawing figures etc.*



## PRACTICAL

There will be FOUR Exercises in each Practical, as under, total of **20 Marks**  
*(1) Approach (2) Readings and Calculations (3) Viva (4) Practical Journal*

Examiner will convert marks out of 10 to prepare Mark Sheet.

Duration of the exam: 3 Hrs. Passing standard: **4 Marks out of 10 Marks.**



**MNPHY – 507**  
**(Thermodynamics, Statistical Mechanics, Electrostatics)**

**Unit-I**

**Thermodynamics**

Second law of Thermodynamics; Carnot's reversible engine; Carnot's engine and refrigerator; Carnot's theorem; Thermodynamic scale of temperature; Entropy and second law of thermodynamics; Entropy changes of closed systems; Entropy; Change in entropy in a reversible process; Change in entropy in irreversible Process; Third law of thermodynamics; Temperature –Entropy diagram.

**Ref. :** Heat and Thermodynamics by- Brijlal and subrahmanyam  
(Chapter 6, Art. 6.25 to 6.29, 6.42 to 6.48)

**Unit-II**

**Statistical Mechanics**

Statistical Basis; Probability; Principle of Equal A Priori Probability; Probability and Frequency; Some Basic Rules of Probability Theory; Permutations and Combinations; Macrostate and Microstate; Thermodynamic Probability. Fluctuation and there dependence on n, Constraints on a system, Static and Dynamic systems, Most Probable state.

**Ref. :** Heat and Themodynamics and Statistical Physics by Brijlal, Subrahmanyam, Hemme. S. Chand & Company (Reprint 2012)  
(Chapter 9, Art. 9.1 to 9.8; 9.9 to 9.12)

**Unit – III**

**Electrostatics**

Electrostatic Energy; Electric Dipol; Dipole in Uniform Electric Field; Electric dipole in Non-Uniform Electric Field; Mutual Potential energy of Two Dipoles; Electric Double layers; Electric Quadrupole. Conductors and Insulators; Conductor in an Electrostatic field; Electric Field at a surface of a Charged Conductor; Capacitors; Electric Response of a Non-conducting medium to an Electric field; Polarization.

**Ref. :** Electromagnetics by B. B. Laud  
(Chapter 1, Art. 1.14 to 1.20; Chapter 2, Art. 2.1 to 2.4, 2.6, 2.7)

**MNPHY – 508 (PRACTICAL)**

- 1) Resonator.
- 2) Optical Lever
- 3) Study of Transformer
- 4) Study of Electron Diffraction Pattern
- 5) Cauchy's Constant
- 6) To determine the diameter of a thin wire by diffraction using LASER.
- 7) Numerical Differentiation.



**MNPHY - 509**  
**(Electronics, Optics)**

**Unit-I**

**Electronic Devices:**

Transistor & its action, Characteristics of Transistor, Use as an Amplifier, FET (Types of Field effect transistor, Junction Field Effect Transistor; Principal and Working of JFET; Schematic symbol of JFET; Importance of JFET) UJT; Equivalent Circuit of UJT; Characteristics of UJT; Solar cell. LED, LED voltage and Current, Advantages of LED Multicolor LEDs, Application of LEDs, Photo Diode, Photo Diode Operation, Characteristics of Photo Diode, Application of Photo Diode,

**Ref. :** Principles of Electronics by V.K.Mehta and Rohit Mehta (11th Edition)

**Unit-II**

**Transistors**

Transistor connections; Common Base Connection; Characteristics of common Base connection; Common Emitter connection; Measurement of leakage current; Characteristics of Common Emitter connection; Common Collector connection; Comparison of Transistor connections; Commonly used Transistor connection; Transistor as an Amplifier in CE arrangement; Transistor Load line Analysis; Operating Point; Practical way of drawing CE Circuit; Output from Transistor Amplifier; Performance of Transistor Amplifier, Cut off and saturation Points

**Ref. :** Principles of Electronics by V.K Mehta and Rohit Mehta (Chapter 8, Art. 8.7 to 8.22)

**Unit-III**

**LASERS**

Introduction; Attenuation of Optical medium; Thermal Equilibrium, Interaction of Light with matter; Absorption; Spontaneous Emission; Einstein Coefficient's and their relations; Einstein coefficients; Einstein Relations; Light Amplification; Condition for Stimulated Emission to dominate Spontaneous Emission; Condition for Stimulated Emission to dominate Absorption transitions; Meeting the three requirements; Population Inversion; Metastable States; Confining radiation with the medium; components of Laser; Active medium; Pump; Optical Resonant Cavity; Lasing Action; Threshold for Oscillation; Principal pumping Scheme; Three level Pumping Scheme; Four level pumping Scheme; comparison of Four Level Laser with the Three level Laser; Necessity of broad absorptions band at pumping Level; Types of LASERS; He-Ne Laser; CO<sub>2</sub> Laser; LASER beam characteristics; Fabrications

**Ref :** A Text book of Optics By Dr. N Subramaniam, Brijlal  
( Chapter : 22.1 to 22.10, 22.14.3, 22.14.4, 22.16, 22.17)



## MNPHY – 510 (PRACTICAL)

### Project Work / Field visit

B.Sc. Sem V

Course code: PHY- SEC-3 (A)

Total Credits: 02 (Practical)

Total Hrs: Practical : 60

### Course Title: Programming in “C” Language

#### Understanding Programming in “C” Language

Unit-1 Input unit - output unit - Central Processing Unit (CPU) - programming languages - algorithms - flow charts - operating system - basic principle  
Basic structure of C - programs - constants - variables - data type - declaration of variables - defining symbolic constants, operators and expression - reading a character - writing a character - formatted input and output statements

Unit-2 Control statements - simple if, if - else, else - if ladder - switching statements - go to statement -break and continue looping - while-do for statements - arrays - user defined functions - string functions - streat, strcpy, strlen, strcmp - elementary idea.

#### Programming in “C” Language

##### Experiments:

Development of algorithm, flow chart and program for the following

- 1 Average of a set of numbers
- 2 Area of a triangle
- 3 Sorting a set of numbers in ascending and descending order
- 4 Summing the series of numbers
- 5 Solving the series of numbers.

##### Reference books:

1. Programming in ANSI C by E. Balagurusamy, McGraw Hill Education (2012)
  2. Programming with C by Byron Gottfried, Jitender Chhabra, Schaum Series (2010)
  3. The Spirit of C by Henry Mullish (Author), Herbert L. Cooper (Author), (1998)
  4. C for all by S. Thamarai Selvi and R. Murugesan, Pearson education (2012)
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#### Assessment : (Internal and External)

There will be FOUR Exercises in each Practical, as under, total of 25 Marks

(1) Approach (2) Program (3) Viva (4) Practical Work Book



**B.Sc. Sem V**  
**Course code: PHY- SEC-3(B)**  
**Total Credits: 02 (Practical)**  
**Total Hrs: Practical : 60**  
**Course Title: Programming in "PYTHON" Language**

**Unit-1**

Input unit - output unit - Central Processing Unit (CPU) - programming languages - algorithms - flow charts - operating system - basic principle  
Basic structure of PYTHON programs - constants - variables - data type - defining symbolic constants, operators and expression - reading a character – writing a character - formatted input and output statements

**Unit-2**

Control statements - simple if, elif, else.  
Looping – while, for statements.  
Lists, user defined functions, string functions.

**Experiments**

Development of algorithm, flow chart and program for the following

1. Add two/three constant numbers.
2. Add two/three variable numbers.
3. Summing the series of numbers.
4. Average of a set of numbers
5. Area of a triangle
6. Declare the maximum and minimum values from the given three numbers.
7. Sorting a set of numbers in ascending and descending order
8. Calculate percentage and assign Grade.
9. Calculate the distance of an object having constant acceleration. (at any time)

**Reference book**

Learn Python 3: by – Ankit Mahato (Open Source Book on github.com)

**Assessment : (Internal and External)**

There will be FOUR Exercises in each Practical, as under, total of **25 Marks**

*(2) Approach (2) Program (3) Viva (4) Practical Work Book*



**K S K V Kachchh University**  
**B. Sc. (Physics) NEP Syllabus**  
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**Semester – VI**

**MJPHY - 601 Quantum Mechanics, Electromagnetism**

**Unit-I**

**Quantum Mechanics**

**One-Dimensional Energy Eigenvalue Problems:** Square-well Potential with Rigid walls; Square-well Potential with Finite walls; Square Potential Barrier; Alpha Emission; Bloch waves in a Periodic Potential; Kronig-Penney Square-well Periodic Potential; Linear Harmonic Oscillator: Schrodinger Method.

**Ref. :** Quantum Mechanics (Second Ed.) by G. Aruldas  
(Chapter 4, Art. 4.1 to 4.7)

**Unit-II**

**Quantum Mechanics**

**Three-Dimensional Energy Eigenvalue Problems:** Particle Moving in a Spherically Symmetric Potential; System of Two Interacting Particles; Rigid Rotator.

**Ref. :** Quantum Mechanics (Second Ed.) by G. Aruldas  
(Chapter 5, Art. 5.1 to 5.4)

**Angular Momentum:** The Angular Momentum Operators; Angular Momentum Commutation Relations; Eigenvalues and Eigenfunctions of  $L^2$  and  $L_z$ .

**Ref. :** Quantum Mechanics (Second Ed.) by G. Aruldas  
(Chapter 8, Art. 8.1 to 8.3)

**Unit-III**

**Electromagnetism**

**Special Techniques :** Laplace's equation; The method of images.

**Ref. :** Introduction to electrodynamics by D. J. Griffiths  
(Chapter 3, Art. 3.1, 3.2)

**Electromagnetic Induction :** Hysteresis; Maxwell's equations; Decay of free charge; Potentials of electromagnetic field; More about the Lorentz gauge condition; Field energy and field momentum.

**Ref. :** Electromagnetics (2<sup>nd</sup> Ed.) by B.B. Laud. (Chapter 5, Art. 5.7 to 5.12)



## MJPHY - 602 PRACTICALS

- (1) Acceleration due to Gravity by Kater's Pendulum (Variable Knife Edges)
- (2) To Determine Coefficient of Thermal Conductivity of Rubber Tube
- (3) Viscosity by Log Decrement Method
- (4) Michelson Interferometer – to determine the wavelength Difference
- (5) Refractive Index by Total Internal Reflection
- (6) Dielectric Constant of a Liquid
- (7) To find the roots of a transcendental equation by Bisection method.
- (8) OP-amp as an inverting and Non-inverting amplifier.

## MJPHY - 603 Nuclear Physics

### Unit-I

**Alpha Rays: Spectra and Decay :** Range of alpha particles; Disintegration energy of spontaneous  $\alpha$ -decay; Alpha decay paradox – Barrier penetration.

Ref. : Nuclear Physics by S. B. Patel  
(Chapter 4, Art. 4.II.1 to 4.II.3)

**Beta Rays : Spectra and Decay :** Introduction; Continuous  $\beta$ -ray spectrum - difficulties encountered to understand it; Pauli's Neutrino hypothesis; The detection of neutrino; Parity non-conservation in beta decay.

Ref. : Nuclear Physics by S. B. Patel  
(Chapter 4, Art. 4.III.1 to 4.III.3, 4.III.5, 4.III.6)

### Unit-II

**The Liquid Drop Model of a Nucleus :** Introduction; Binding energies of nuclei – plot of  $B/A$  against  $A$ ; Weizsacher's semi empirical mass formula; Mass parabolas: Prediction of stability against  $\beta$ -decay for members of an isobaric family; Stability limits against spontaneous fission; Barrier penetration – Decay probabilities for spontaneous fission; Nucleon emission.

Ref. : Nuclear Physics by S. B. Patel  
(Chapter 5, Art. 5.1 to 5.7)



### Unit-III

**Nuclear Energy** :Introduction; Neutron induced fission; Asymmetrical fission – mass yield; Emission of delayed neutrons by fission fragments; Energy released in the fission of  $^{235}\text{U}$ ; Fission of lighter nuclei; Fission chain reaction; Neutron cycle in a thermal nuclear reactor; Nuclear reactors.

Ref. : Nuclear Physics by S. B. Patel  
(Chapter 6, Art. 6.1 to 6.9)

**Elementary Particles** : Leptons; Hadrons; Elementary particle quantum numbers; Quarks; History of universe.

Ref. : Concepts of Modern Physics (Fifth Ed.) by Arther Beiser  
(Chapter 13, Art. 13.2 to 13.5, 13.7)

### MJPHY - 604 PRACTICALS

- (1) Mutual Inductance by Ballistic Galvanometer
- (2) Passive Filters
- (3) Colpitt Oscillator – Measurement of Frequency by C.R.O.
- (4) Parallel Resonance – Determination of Band Width and Q – Factor
- (5) Half Adder and Full Adder
- (6) Numerical Integration
- (7) To Determined Decay Constant by Thermocouple
- (8) Negative feedback amplifier using OP-amp



## MJPHY - 605 Statistical Mechanics,

### Unit-I

#### Statistical Mechanics

**Maxwell - Boltzmann Statistics :** Introduction; Three kinds of Particles; M.B. Statistics applicable to ideal gas; Maxwell Boltzmann energy distribution law; Applications of M.B. distribution law; Mean, RMS and Most probable speeds; Doppler Broadening of spectral lines; Limitations of Maxwell - Boltzmann method; Experimental verification of Maxwellian distribution of molecular speeds.

**Ref. :** Heat Thermodynamics and Statistical Physics  
by Brijlal, Dr. N. Subrahmanyam, P.S Hemne  
(Chapter 11, Art. 11.1 to 11.5, 11.7 to 11.9)

### Unit-II

#### Statistical Mechanics

**Quantum statistics :** Need of Quantum statistics; Development of Quantum statistics; 'h' as a natural constant; Indistinguishability of particles and its consequences; Bose - Einstein distribution law; Photon gas; Plank's radiation law; Fermi-Dirac distribution law; Maxwell-Boltzmann Distribution as a limiting case of B - E and F-D Distributions; Comparison of M - B, B - E and F - D Statistics; Difference between Classical and Quantum Statistics.

**Ref. :** Heat Thermodynamics and Statistical Physics  
by Brijlal, Dr. N. Subrahmanyam, P.S Hemne  
(Chapter 12, Art. 12.1 to 12.8, 12.13, 12.15, 12.16)

### Unit-III

#### C.R.O.

**Cathode Ray Oscilloscope :** Cathode Ray Oscilloscope; Cathode Ray tube; Deflection systems; Mathematical expression for electrostatic deflection sensitivity; Electromagnetic deflection system; Magnetic deflection in C.R. Tube; Uses of CRO.

**Ref. :** Electronics and Radio Engineering (Eighth Ed.) by M. L. Gupta  
(Chapter 36, Art. 36.1, 36.2, 36.7, 36.8 to 36.10, 36.20)



## **Regulated D.C. Power Supply**

17.1 Ordinary D.C. Power Supply 17.2 Important Terms 17.3 Regulated Power Supply 17.4 Types of Voltage Regulator 17.5 Zener Diode Voltage Regulator 17.6 Conditions for Proper Operations of Zener Regulator 17.7 Transistor Series Voltage Regulator

Ref. :Principles of Electronics by V.K.Mehta and Rohit Mehta (11thEdition)

## **MJPHY - 606 PRACTICALS**

Project Work / Field Visit

### **PATTERN OF QUESTION PAPER**

### **FOR SEMESTER-END EXAMS**

### **THEORY**

In each theory paper there will be FOUR Questions **10 Marks.** (Q.1 to Q.3), one question from every unit, which consist 2 questions of same weightage and student has to attempt any one. A Q.4 will be of 12 Objective/ 1 marks questions, 4 from each unit. Student has to attempt any 10. Duration of the exam: 2 Hrs 15 Min. Passing standard: **16 Marks out of 40 Marks.**

The structure for each question is as under:

**Q.1 to Q.3 Descriptive type (with internal option) 10 Marks**

*The types of questions are varied, like: Derivations,  
Short notes, Problems etc.*

**Q.4 Objective type 10 Marks**

*The types of questions are varied, like: One line answers,  
Two line answers, Definitions, Reasoning, Drawing figures etc.*

### **PRACTICAL**

There will be FOUR Exercises in each Practical, as under, total of **20 Marks**

(1) Approach (2) Readings and Calculations (3) Viva (4) Practical Journal

Examiner will convert marks out of 10 to prepare Mark Sheet.

Duration of the exam: 3 Hrs. Passing standard: **4 Marks out of 10 Marks.**



Unit-I

Classical Mechanics

Mechanics of System of particles; Motion of a system with variable mass;  
**Moving Coordinate system:** Coordinate system with relative translational motions;  
Rotating coordinate systems; The coriolis force; Motion on the earth; Effect of coriolis force on a freely falling particle.

Ref. : Introduction to Classical Mechanics by R.G. Takwale & P.S. Puranik  
(Chapter 3, Art. 3.5 & 3.6; Chapter 9, Art. 9.1 to 9.5)

More Ref. - Classical Mechanics by J C Upadhyay

Unit-II

Quantum Mechanics

Difficulties with classical models; Optical Spectra; Blackbody radiation; The Franck-Hertz experiment.

Photons as particles: The Compton effect; Particle diffraction.

Ref.: Quantum Mechanics by John. L. Powell, Bernd Crasemann  
(Chapter 1, Art. 1.1 to 1.3, 1.5; Chapter 2, Art. 2.1, 2.2)

Quantum Mechanics; The wave equation; Schrodinger's Equation: Time Dependent form; Expectation Values; Schrodinger's Equation: Steady state form; Particle in Box.

Ref.: Concepts of Modern Physics by Arthur Beiser.  
(Chapter 5, Art. 5.1 to 5.6)

Unit-III

Digital Electronics

**Number Systems and Codes :** Hexadecimal numbers; Hexadecimal - Binary conversions; Hexadecimal - to - decimal conversion.

Ref. : Digital Computer Electronics by Albert Paul Malvino (Second Edition )  
(Chapter 1, Art. 1.8 to 1.10)

**More Logic Gates :** NOR gates; De Morgan's First theorem; NAND gates; De Morgan's Second theorem; Exclusive OR gates.

Ref. : Digital Computer Electronics by Albert Paul Malvino (Second Edition )  
(Chapter 3, Art. 3.1 to 3.5)

**Boolean Algebra and Karnaugh Maps :** Boolean relations; Sum - of - Products method; Algebraic simplification; Karnaugh maps; Pairs, Quads and Octets; Karnaugh simplifications; Don't Care Conditions.

Ref. : Digital Computer Electronics by Albert Paul Malvino (Second Edition )  
(Chapter 5, Art. 5.1 to 5.7)

**Arithmetic - Logic Units :** Binary addition; Binary subtraction; Half adders; Full adders; Binary adders.

Ref. : Digital Computer Electronics by Albert Paul Malvino (Second Edition )  
(Chapter 6, Art. 6.1 to 6.5)



**MNPHY - 608 (PRACTICAL)**

- (1) Absorption co-efficient of Liquid by photocell
- (2) Permeability of Free space
- (3) NAND Gate as universal gate
- (4) h- Parameters
- (5) Characteristics of UJT
- (6) Numerical Interpolation
- (7) Obtain I - V Characteristics and Resistance of LDR at Different Light Level

