प्राचार्य/प्राचार्य,
समस्त सम्बन्ध महाविद्यालय,
एम० जे ० पी० रूहेलखण्ड विश्वविद्यालय, बरेली।

विषय : एम०एस०सी० भौतिक विज्ञान विषय का नवीन पाद्यक्रम सत्र 2017-18 से प्रभावी
किये जाने के सम्बन्ध में।

महादेव/महोदय,

विषय पाद्यक्रम समिति की बैठक दिनांक 22.08.2016 द्वारा प्रस्तावित एम०एस०सी०
भौतिक विज्ञान का पाद्यक्रम जो दिनांक 25-10-2016 एवं
कार्य परिषद की बैठक दिनांक 25।10।2016 द्वारा अनुमोदित किया जा चुका है, को
विश्वविद्यालय की वेबसाइट www.mjpru.ac.in पर इस आशय से अपलोड किया जा
रहा है कि समस्त सम्बन्ध महाविद्यालय जहाँ यह पाद्यक्रम संचालित हो रहा हो, वे उक्त
पाद्यक्रम के अनुसार ही सत्र 2017-18 से पठन-पाठन सुनिश्चित करने का कष्ट करें।

भवदीय

(डा।० एस।० एल।० मोर्द) कुलसचिव

प्रतिलिपि : निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
1. निजी सचिव, कुलपति को कुलपति महोदय के संज्ञानार्थ।
2. परीक्षा विभाग।
3. प्रभारी अति गोपनीय/कम्प्यूटर अनुभाग/शैक्षणिक अनुभाग

कुलसचिव
M. J. P. ROHILKHAND UNIVERSITY, BAREILLY

Course Structure for M.Sc. (Physics)
With Specialization in Electronics

This is a two-year course. Each year there will be four theory papers and one practical with aggregate marks 600. The details are as follows:

M.Sc. (P)  600 Marks

Paper-1  Mathematical Physics (60 marks) & Classical Mechanics (40 marks)
Paper-2  Quantum Mechanics (40 marks) & Atomic and Molecular Spectroscopy (60 marks)
Paper-3  Solid State Physics, Electronics (60 Marks) & Nano Science (40 Marks)
Paper-4  Statistical Mechanics (60 marks) & Electrodynamics (40 Marks)

Paper-5  Practical  200 Marks
(a)  Two Practical  120 Marks (60 marks each)
(b)  Record  40 Marks
(c)  Viva-Voice  40 Marks

M.Sc. (F)  600 Marks

Paper-1  Advanced Quantum Mechanics  100 Marks
Paper-2  Nuclear & Particle Physics  100 Marks
Paper-3  Communication Electronics  100 Marks
Paper-4  Analog& Digital Electronics  100 marks

Paper-5  Practical & Project Work  200 Marks
(a)  Two Practical  100 Marks (50 marks each)
(b)  Record  25 Marks
(c)  Viva-Voice  25 Marks
(d)  Project  50 Marks

The last date for the submission of project report will be 31st January every year so that the examiner may evaluate the same in due course of time. The university will appoint separate examiners for the said purpose. Only the faculty members of the aided colleges (as internal) shall guide the project.
M.Sc. Previous

Paper I: Mathematical Physics (60 marks) & Classical Mechanics (40 marks)

Mathematical Physics

Unit I
Analytic functions, The Cauchy-Riemann Equations, Cauchy’s Integral Theorem, Cauchy’s Integral formula for a Function and its derivatives, Taylor & Laurent Series, Singularities of a function, Zeroes and Poles, Cauchy’s Residue Theorem, Contour Integration of Simple functions.
Legendre, Bessel, Hermite Differential Equation: Solution and Orthonormal Properties
Linear Ordinary Differential Equations of First and Second Order, Partial Differential Equations (Laplace, Wave and Heat Equations in two and three dimensions), Green’s function method of solving inhomogeneous boundary value problems

Unit II
Fourier series and Fourier Transforms, Applications to boundary value problems, Interpolation (equal and unequal intervals), extrapolation, Numerical Integration by Trapezoid and Simpson’s Rule, Solution of first order differential equations using Runge-Kutta method, Finite difference methods

Unit III
Covariant and Contravariant Tensor, Contraction of tensors, Metric Tensor.
Elementary theory of Probability, Random Variables, Binomial, Poisson & Normal distributions, Central Limit theorem, Data interpretation and Analysis, Precision and Accuracy, Error analysis, Propagation of errors, Least squares fitting
Abelian Group, Cyclic Group, Group Multiplication Table, Subgroups, Cosets, Conjugate Elements and Classes, Reducible and Irreducible Representations of a Group, Character tables, SU(3) and O(3)

Books Recommended
1. Mathematical Physics: PC Chattopadhyay, Wiley Eastern
2. Special Functions by WW Bell
3. Mathematics for Physicists: Mary L Boas
4. Mathematical Methods for Physics: G Arfken
5. Advanced Engineering Mathematics by E. Kreyszig
6. Group Theory and Quantum Mechanics: M Tinkham, TMH
7. Matrices and Tensors for Physicists by A.W. Joshi
10. Complex Variables , Schuam’s Outline Series

Classical Mechanics

Unit I
Lagrange’s equations of motion, Application to simple problems, Conservation laws and Symmetry properties, Noether’s Theorem, Hamilton’s principle, Derivation of Lagrange’s Equations from Hamilton’s principle
Hamilton’s Equations, Hamiltonian, Application to simple problems, Canonical Transformations, Poisson Brackets, Equation of motion in Poisson Bracket form, Jacobi’s Identity, Poisson Brackets and Canonical Transformations, Hamilton-Jacobi theory, Application to Harmonic Oscillator problem and Kepler’s problem

Unit II
Rigid body dynamics, Moment of Inertia Tensor, Euler’s equations, Theory of small oscillations, Normal modes, Central force motions, two bodies Collisions-Scattering in laboratory and Centre of mass frames
Books Recommended
5. Classical Mechanics of Particles and Rigid Bodies: Kiran C Gupta

Paper 2: Quantum Mechanics (40 Marks) and Atomic & Molecular Spectroscopy (60 Marks)

Quantum Mechanics
Unit I
Postulates of Quantum Mechanics, Wave function in Co-ordinate &Momentum Representation, 
Momentum Eigen-Functions, box normalization, Schrödinger Equation for Spherically Symmetric 
Potentials, Degeneracy, Hydrogen Atom, Radial Equation, Eigen Values and Eigen Functions, Radial 
Probability
Linear operators, Hermitian operators, unitary operators and Unitary Transformation, Matrix 
representation of operators, Diagonalization of matrices, Parity operator, Simultaneous measurement and 
commuting operators

Unit II
Angular momentum operators and their commutation relations, Ladder operators, Introduction to Dirac’s 
Bra andKet notation, Matrices for J^+ , J_-, Jz, Jx, Jy, & J ;Addition of two angular momenta-Clebsch-Gordon 
coefficients
Time independent perturbation theory-non degenerate and degenerate cases, applications to Harmonic 
oscillator, Ground state of He atom, Zeeman Effect without electron spin, first order & second order Stark 
effect in Hydrogen
The Variational method-application to ground state & excited states of He atom, electron interaction 
energy, variation of parameter
W.K.B. method and its application to alpha decay problem, identical particles and exchange degeneracy, 
symmetric and anti-symmetric wave functions

Books Recommended
1. Quantum Mechanics: LI Schiff, McGraw Hill
2. Quantum Mechanics: Mathews and Venkatesan
3. Quantum Mechanics: Ghatak and Loknathan
4. Quantum Mechanics: Merzbacker
5. Quantum Mechanics: AP Messiah

Atomic and Molecular Spectra
Unit I: Atomic Spectra
Relativistic correction for energy levels of Hydrogen, Spin-orbit interaction and fine structure, Lamb- 
shift, Spectra of alkali atoms, LS & jj couplings
Normal and Anomalous Zeeman Effect, Paschen –Back effect, Hyperfine structure and isotopic shift, 
examples of hyperfine structure, Back &Goudsmit effect
Weak field and strong field Stark effect in Hydrogen, Natural width, Doppler width, Collision and 
pressure induced width of spectral lines, Width due to stark effect

Unit II: Molecular Spectra
Observed molecular spectra and their representation by empirical formulae- Different energy states of 
molecules, spectra in the visible and ultraviolet regions, spectra in the infrared region, microwave spectra, 
Raman spectra
Interpretation of the principal features of infrared and Raman spectra by means of the models of the 
Rigid –rotator and of the Harmonic oscillator, interpretation of the fine details of infrared and Raman 
spectra by means of the models of An-harmonic oscillator, non-rigid rotator, Vibrating rotator and 
Symmetric top, Intensities in Rotation- Vibration spectra
Unit III: Electronic Spectra

Books Recommended
1. Introduction to Atomic Spectra by H. E. White
2. Fundamentals of Molecular Spectroscopy by C. M. Banwell
4. Introduction of Molecular Spectroscopy by G. Barrow
5. Spectra of Diatomic Molecules by G. Herzberg

Paper 3: Solid State Physics, Electronics (60 Marks) and Nano Science (40 Marks)

Unit I: Electronics
JFET—Construction, Working, Biasing, as an amplifier; Depletion & Enhancement MOSFET—Construction, Working, applications; Power Amplifiers—Class A, Class B, Class AB, Class C; Multivibrators; Regulated Power Supply
Veractor, shottky, liquid crystal diode, diac, triac, LDR and its uses in ac voltage regulators, darlington pair, SMPS

Unit II: Solid State Physics
Free electron gas in three dimensions, Heat Capacity of the electron gas, Response and Relaxation phenomena, Drude Model of electrical and thermal conductivity of metals, Sommerfield Model of electrical conductivity, Wiedemann-Franz law, Hall effect and Thermoelectric power
Kronig—Penney model, band theory of solids, distinction between Metal, Semiconductor and Insulators, Effective Mass of electrons, Experimental methods in Fermi surface determination—de Hass-van Alphen effect

Unit III: Superconductivity and Magnetism
Superconductivity: Meissner effect, isotope effect, Heat Capacity and Energy gap, Type I & Type II Superconductors, Thermodynamics & Electrodynamics of superconducting transition, Electron-Electron interaction via phonons—BCS theory, High Tc superconductors, Superconducting tunneling—Dc and Ac Josephson effects, SQUID’s
Weiss Theory of Ferromagnetism, Exchange interaction, Temperature Dependence of Saturation Magnetization, Antiferromagnetic Order—Neel temperature, Nuclear Magnetic Resonance (NMR), Electron Spin Resonance (ESR), Mossbauer Effect, Debye-Waller factor
Frenkel & Schottky defects, Order-disorder transformation, elementary idea of dislocations, Liquid crystals, types and properties of liquid crystals, applications

Unit IV: Nano Science-1
Nano science & Nano technology, Size effect, Quantum confinement, Fullerines and carbon Nano tubes, single wall and multi wall Carbon nanotubes, mechanical and electronic properties of Carbon nanotubes, carbon nanotube based electronic devices, other types of nanotubes, methods of synthesis of Nano structured materials, Quantum wells, Quantum wires and Quantum dots

Unit V: Nano Science-2
Films and surfaces—Study of surface topography by multiple beam interferometries, conditions of accurate determination of step height and film thickness, electrical conductivity of thin films, elementary concepts of surface crystallography, Scanning, Tunneling and Atomic Force Microscopy

Books Recommended
2. Introduction to Solid State Physics: C. Kittel
Statistical Mechanics

**Unit I**
Phase space of a classical system, the macroscopic and the microscopic states, quantum states and the phase space, magnetization of spin-half system, the micro canonical ensemble and its application to one-dimensional harmonic oscillator
Canonical Ensemble- Partition function, free energy and its connection with thermodynamic quantities, energy fluctuations, application to the system of harmonic oscillators
Grand Canonical Ensemble-equilibrium between a system and particle-energy reservoir, grand partition function, chemical potential, application to a system of independent and localized particles, density and energy fluctuations

**Unit II**
Identical particles, symmetric and antisymmetric wave functions, partition function for bosons and fermions, Ideal Bose Gas- thermodynamic behavior, Bose-Einstein Condensation, blackbody radiation and Planck’s law, Ideal Fermi Gas-thermodynamic behavior, magnetic behavior- Pauli Paramagnetism, Landau theory of diamagnetism

**Unit III**
Phases of matter, Thermodynamic Potential, First- order phase transitions, Continuous phase transitions, Ising model-mean field theory, Order parameter, Landau theory, Superfluidity, Diffusion Equation, Random walk and Brownian motion

**Books Recommended**
4. Statistical Mechanics:K.Huang, JohnWiley& Sons Ltd.
7. Statistical Physics: F.Mandl, JohnWiley&Sons Ltd.
8. Introductory Statistical Mechanics: RogerBowley and Mariana Sanchez, Oxford University Press
Electrodynamics

Unit I

Unit II
Maxwell’s modification of Ampere’s Law- Displacement Current, Maxwell’s Equations in free space and linear isotropic media, boundary conditions on the fields at interfaces, Electromagnetic waves in free space, dielectrics and conductors; Reflection and Transmission-Fresnel’s Law, Polarization. Propagation of Electromagnetic Waves in Rectangular Waveguides-TE and TM Modes, Cut off frequency, Energy Flow and Attenuation, Modal Analysis of guided modes in a cylindrical waveguide. Multipole expansion of electromagnetic fields, Field and Radiation due to an Oscillating Electric Dipole, field due to a Magnetic Dipole, Retarded and Advanced Potentials, Lienard-Wiechart Potentials for moving charge, fields produced by a charge in uniform and accelerated motion, Radiated power, angular distribution of radiation due to accelerated charge, Bremsstrahlung, Synchrotron Radiation.

Books Recommended
2. Classical Electricity and Magnetism: Panofsky and Phillips, Addison Wesley
4. Introduction to Electrodynamics: AZ Capri and PV Panat, Narosa Publishing House
M .Sc. Final

Paper I: Advanced Quantum Mechanics

Unit I: Time Dependent Perturbation Theory


Schrödinger, Heisenberg and Interaction picture, representation of operators and equations of motion, Dyson’s time-ordered operator and Dyson series

Unit II: Many Electron Systems-Atoms and Molecules


Unit III: Scattering Theory

Differential &Total Scattering cross sections, relation between angles, energies and cross-sections etc in Laboratory and Center of mass system of coordinates, normalization of incoming wave-Green’s function for scattering, Scattering amplitude, Born approximation- Integral equation of scattered waves, Condition for validity of Born approximation, scattering by a Screened Coulomb potential- Rutherford scattering formula, scattering by square well & Gaussian potentials under Born approximation

Scattering theory and time dependent perturbation, Method of partial wave and phaseshifts, Optical theorem, scattering by a perfectly rigid sphere, scattering by a square well potential, Lippmann-Schwinger equation and the scattering matrix

Unit IV: Identical Particles and Spin

Angular momentum, Integral and Half integral angular momentum spin Eigen functions, Conservation rules, Identical particles, Physical meaning of identity, Distinguishability of identical particles, Symmetric and Antisymmetric wave function, Construction from unsymmetrised function, Slater’s Determinant, Connection of spin and statistics, Pauli spin matrices, scattering between identical particles, Stern-Gerlach Experiment

Unit V: Relativistic Wave equations


Second quantization of harmonic oscillator, the N representation, Creation, Destruction, and Number Operators, Vacuum State, One-body and two-body operators in Occupation number representation, Coordinates of the Schrödinger field, The Klein-Gordon field, The Dirac field, and the Electromagnetic field

Books Recommended

1. Quantum Mechanics: LI Schiff, McGraw Hill
2. Quantum Mechanics: Mathews and Venkatesan
3. Quantum Mechanics: Ghatak and Loknathan, MacMillan Publishers
4. Quantum Mechanics: Eugen Merzbacher, John Wiley & Sons
5. Quantum Mechanics: AP Messiah
6. Modern Quantum Mechanics: JJ Sakurai, Addison Wesley
7. Quantum Mechanics: DJ Griffith, Pearson Education
8. Quantum Mechanics VolI & II: Cohen Tannoudji, John Wiley

Paper II Nuclear & Particle Physics

Unit I: Basic Properties of Atomic Nucleus and Nuclear Models
Nuclear size and charge distribution, High-energy electron scattering (Hofstadter method)
Shape of nucleus- electric dipole and quadrupole moments, magnetic moment, experimental
determination of magnetic moment and electric quadrupole moment
Angular momentum, parity and statistics of the nucleus
Liquid drop model: semi-empirical mass formula, mass parabola, nuclear fission, nuclear fusion
Evidence of shell structure in nuclei, qualitative discussion of extreme single particle model, quantitative
treatment of single particle states in nuclei, Spin-orbit interaction and nuclear levels, reproduction of
magic numbers and spins and parities, Islands of Isomerism, Validity and limitations of Shell model,
Single particle shell model, Independent particle model
Collective model- simple discussion of rotational and vibrational states, Electromagnetic properties of
even-even and odd-odd nuclei

Unit II: Two body problem and Nuclear Forces
Qualitative and quantitative discussion of ground state of deuteron (using central force)
Neutron- proton scattering below 10 Mev, Partial wave analysis and scattering length, effective range
theory, spin dependence of n-p interaction, effect of chemical binding on n-p scattering, Low energy p-p
scattering
Spin dependence and non-central feature of nuclear forces, general form of non-central forces and their
properties, qualitative and quantitative discussion of ground state of deuteron and its magnetic moment
using non central forces
Qualitative discussion of exchange forces, Isospin formalism, general form of nucleon-nucleon interaction

Unit – III: Nuclear Decay
Alpha decay: Measurement of energy of alpha particles, Absorption of alpha particles-Range, Ionization
and Stopping power, Range-energy curves, Fine structure of alpha particles, Nuclear energy levels, Gamow’s theory and Geiger-Nuttal law
Beta decay processes, measurement of beta ray energies, Neutrino hypothesis, Fermi’s theory of beta
decay, Kurie plots, allowed and forbidden transitions, Selection rules, Non-conservation of parity in beta
decay
Electromagnetic interactions in nuclei, Multipole transitions in nuclei, Parity and angular mom
entum selection rules, Internal conversion, Comparative half life, Allowed and forbidden transitions,
Gamma decay and nuclear energy levels-nuclear isomerism

Unit – IV: Nuclear Reactions and Detectors & Accelerators
Description of Nuclear reactions, Reaction kinematics-Q value equation,
Discussion of Direct and Compound nuclear reaction mechanisms, expressions for scattering and reaction
crosssections in terms of partial wave amplitudes, Resonances, Discussion and applications of Breit-
Wigner single level formula, Stripping and pic-up reactions with Shell models
Outline of interaction of charged particles and of Gamma rays with matter, Ionization Chamber, Solid-
state detectors, G.M Counter, Scintillation Counter, Cerenkov Detectors, Scaling Circuits, Coincidence
circuits, Radiation detectors, and Neutron detection techniques, Accelerators-Ion Sources, Cyclotron,
Synchrotron, Synchro-cyclotron,Betatron, Introduction of Modern Colliders (LHC and RHIC), and Storage Ring

Unit V: Elementary Particles
Classification of fundamental forces, elementary particles and their quantum numbers (Charge, Spin,
Parity, Isospin, Strangeness etc.), Nishijima Scheme, Conservation laws, Associated production and
Strangeness, Space-inversion Invariance (parity), Time reversal and charge conjugation, Combined
Inversion(CP) violation, Combined inversion of CPT , Baryons and Mesons, Quark Model , SU(2) and
SU(3) symmetries
Books Recommended
1. Atomic and Nuclear Physics, Vol. II: S.N.Ghoshal
3. Introductory Nuclear Physics: S.S.M.Wong
4. Nuclear Theory: Elton
5. Nuclear Physics: C.Cohen
6. Nuclear Structure: Preston and Bhaduri
8. Nucleon-nucleon Interaction: Brown and Jackson

Paper III: Communication Electronics
Part A: Analog Communication Systems

Unit I: Microwave Electronics & Radar Communication
Microwave characteristic features & Applications, Waveguides and Cavity Resonators,
Two Cavity Klystron, Reflex Klystron, GunnEffect& Gunn diode, Gunn Oscillators,
Microwave antenna, Detection of microwaves, Dielectric constant measurement, Isolator and circulator, P IN diode modulator, Directional coupler
Basic Radar systems, Radar range equation and performance factor, Radar Crosssection, Pulsed Radar sys tem, Duplexer, Radar Display, Doppler Radar, CWIF Radar, FMCW Radar, Moving Target Indicator (M TI), Blind Speeds

Unit II: Analog Signal Transmission
Modulation, Amplitude, Frequency & Phase modulation, AM, FM, Modulating and Demodulating circuits, AM, FM Receivers functioning (BLOCK diagram) and Cha racteristic Features, Pulse modulation, Sampling processes, PAM, PWM and PPM modulation and d emodulation, Quantization processes, Compounding and Quantization noise, PCM, Differential PCM and Delta Modulation systems, Comparison of PCM and DM, Time division multiplexing

Unit III: Satellite Communication
Principle of Satellite Communication, Satellite frequency allocation and band spectrum, Satellite orbit, traj ectory and its stability, Satellite link design, Elements of Digital Satellite Communication, Multiple Acce ss technique, Antenna system, Transponder, Satellite Applications

Part B: Digital Communication Systems
Unit IV: Signals, Systems and Noise
Elements of communication systems, Fourier representation of periodic and non- periodic signals, Power spectral density, Impulse and step response of systems, Time and frequency doma in analysis of systems, Ideal and Real filters, Noise in communication systems, Represen tation of narrow band noise, Signal to noise ratio, Noise equivalent band width and noise figure
Introduction, Amount of information, Average information, Shannon’s encoding algorithm, communicati on channels, Rate of information and capacity of discrete memoryless channels, ShannonHartley theorem.

Unit V: Digital Signal (Data) Transmission & Fiber Optic Communication
Introduction, Base band and Pass band data transmission. Base band binary PAM system, Optimum rec eiver for binary digital modulation schemes, Binary ASK, FSK, PSK and differential PSK signaling sche mes, Serial data communication in computers, USART 8251, MODEM
Basic optical communication system, wave propagation in optical fiber media, step and graded index fiber, material dispersion and mode propagation, losses in fiber, optical fiber source and detector, optical joints and coupler. Digital optical fiber communication system, First/Second generation system, D ata Communication Network
**Books Recommended**
2. Communication Systems: Simon Haykin
3. Optical Fibre Communication: Kaiser
4. Microwave and Radar Engineering: M. Kulkarni
5. Electronic Communication Systems: Kennedy & Davis
6. Satellite Communication: Pratt and Bostierm
7. Microwaves: K.C. Gupta

**Paper IV: Analog & Digital Electronics**

**Unit I**
Frequency Response of Op-Amp, Active Filter, Comparator, Monostable, Astable, and Bistable Multivibrators, Schmitt Trigger, Triangular wave generator, Voltage Controlled Oscillator, Phase Locked Loop (PLL), Voltage to Frequency and Frequency to Voltage convertor, 555 timer and its applications

**Unit II**
Number Systems, Codes (Grey code, ASCII code and BCD code), Logic gates, Half & full adder and subtractor, RTL, DTL, TTL and ECL Logic circuit, Karnaugh (K-) Map, Pairs, Quads and Octets, RS, JK, D, T, JK M/S Flip flops, Race problem, Preset and Clear inputs
Pin out Diagrams, Truth Tables and Working of Decoders: 1-of-4 (IC 74AS139) and 1-of-16 (IC 74154), BCD to Decimal Decoder (IC 7445), BCD to Seven Segment Decoder Driver (IC 7446A, 7448), Encoders: Decimal to BCD Encoder (IC 74147), Multiplexers: 16-to-1 (IC 74150) and Implementation of Boolean Functions, Demultiplexer: 1-of-16 Demultiplexer/ Decoder (IC 74154)

**Unit III**
Shift Registers: SISO, SIPO, PISO, PIPO, Universal Shift Register. Tristate Switches, Tristate Registers, Asynchronous and Synchronous Counters, Up, Down, Parallel, Modulus Counters: Counter Reset Method, Logic Gating Method, Ring Counter. Memory Devices: Read Only Memories, Masked Memory, ROM, Programmable ROM, EPROM, Random Access Memory (RAM), Static (SRAM) and Dynamic (DRAM) RAM, Bipolar Ram Cell, Static RAM cell

**Unit IV**
Weighted Resistor D/A Converter, Ladder Network D/A Converter, D/A Converter Specifications - Resolution, Accuracy, Linearity, Settling Time, Temperature Sensitivity
A/D Conversion, Quantization and Encoding, Parallel-comparator A/D Convertor, Successive Approximation A/D Convertor, Counter method, Single and Dual Slope A/D Convertor, Specifications of A/D converters

**Unit V**

**Books Recommended**
1. Integrated Electronics, Millman and Halkias
2. Op Amp and Linear Integrated Circuits, R. A. Gayakwad
3. Linear Integrated Circuits, Choudhary and Jain
4. Digital Principle and Applications, A P Malvino and D P Leach
5. Digital Circuit and Design, S. Salivahanan and S. Arivazhagan
6. Modern Digital Electronics, R.P. Jain
7. Microprocessor Architecture, Programming, and Applications with the 8085, R S Goankar

PRACTICALS

A: GENERAL EXPERIMENTS

1. Hall Effect
2. E.S.R
3. Four Probe
4. Forbidden Energy Gap
5. GM Counter
6. B-H Curve
7. Klystron
8. Study of He-Ne Laser
9. e/m helical method
10. Ultrasonics

B: ELECTRONICS EXPERIMENTS

1. Study of Digital Circuits
2. Study of Microprocessor IC 8085
3. Study of Difference Amplifier
4. Study of Schmitt Trigger
5. Study of PAM, PWM, PPM
6. Study of PCM Receiver and Transmitter
7. Study of OpAmp Characteristics
8. Study of Analog to Digital Converters
9. Study of Digital to Analog Converters
10. Study and design of Multivibrators
11. Study of 555 Timers
12. Study of ALU IC 74181
13. Study of flip-flops
14. Verification of Network Theorems
15. Study of RAM
16. Determination of Hybrid Parameters
17. Characteristics of FET

NB: The above list of experiments to be divided into two parts for M.Sc. (P) & M.Sc. (F) and there may be changes in the list as per availability in the respective labs.