M.Sc. Electronics & Communication

PAPER –1 Mathematical Methods

UNIT-I

Complex variable: Analytic functions, Cauchy-Riemann equations, properties of analytic functions, Complex integration, Cauchy's theorem, Cauchy's integral formula, Taylor's series, Laurent's series, Singularities, Residues, Cauchy Residue theorem, evaluation of real definite integrals, conformal mapping and invariance of functions by contour integral, Problems.

UNIT-II

Fourier series: Dirichiet's conditions, General Fourier series, Half range sine and cosine series, odd and even functions, Parseval's identity, Complex form of Fourier series, Harmonic Analysis.

Fourier Transforms: Fourier integral representation, Fourier transform pairs, Properties, Fourier sine and cosine Transforms, transforms of simple functions, transforms of derivatives, The convolution integrals of Fourier, Application to one dimensional wave and diffusion equations.

UNIT-III

Laplace Transforms: Transforms of simple functions, properties, Transforms of derivatives and integrals, transform of periodic functions, Convolution theorem, evaluation of integrals by Laplace transforms, Inverse transforms, Laplace transform of delta, unit and step functions, Initial and final value theorems, Applications of Laplace transforms to linear ordinary differential equations.

UNIT-IV

Numerical solution of algebraic and transedental equations, iterative algorithms, convergence, Newton-Rapson Procedure, Solution of Polynomial and Simultaneous linear equations. Direct methods - Gauss, Gauss-Jordan, Crout's methods, Iterative emthods – Jacobi's, Gauss-Seidal methods, relaxation procedure, error estimates,

UNIT-V

Numerical integration, Euler-Maclaurin formula, Newton-Cotes formula, error estimates. Gaussion quadratives, extensions to multiple integrals. Numerical integration of ordinary differential equations. Methods of Euler, Adams, Runge-Kutta and predictor-corrector methods, boundary value problems.

Textbooks:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2003.
2. P. Kandasamy, K. Thilagavathi, and K. Gunavathi, Numerical Methods, Volume-4, S.Chand & Co., 1999.

Reference books:

1. M.K. Venkatraman, Engineering Mathematics, The National Publishing Company. 2003.
2. Veerarajan, T., Engineering Mathematics, TMH, II Ed., 2002.
3. M.R. Spiegel, Laplace Transforms, Schaum's Outline Series, McGraw Hill, 2003.
4. S.S. Sastry, Introductory methods of Numerical Analysis, PHI, 1991.

PAPER - 2 Measurement Systems and Transducers

Measurement systems

UNIT-I

Basic methods of measurement, Units and standards, calibration, Errors in measurement, uncertainties, gross errors, systematic errors and random errors, statistical analysis of random errors.

Functional Elements of an instrument: Static Characteristics: Accuracy, Precision, Bias, Errors and accuracy calculations, sensitivity, linearity, threshold, resolution, hysterisis and dead space.

UNIT-II

Dynamic characteristics: Generalized mathematical model of measurement system, transfer function, zero order instrument; First order instruments, Second order instruments - Step, Ramp, Impulse and Frequency responses of above instruments, Dead Time elements, Frequency response curves, Response of general form of instruments to a periodic, transient input. Frequency spectra of amplitude modulated signals.

Transducers

UNIT-III

Passive, Active Transducers, Digital Transducers.

Variable Resistance Transducers: Potentiometers - Characteristics, loading effects; Strain gauge - gauge factor, bridge circuit for voltage and current excitation, signal conditioning circuits for dc, ac excitation, temperature compensation, Resistive Temperature transducers - RTD, thermistor, photo resistor, Humidity sensors - hot wire anemometer, constant-current constant-temperature type.

UNIT-IV

Variable Inductance Transducers: LVDT - construction, working principle, performance characteristics and applications. Signal conditioning for dynamic measurements.

Variable Capacitance Transducers: Various types, signal conditioning circuits, capacitive microphone, frequency response, applications.

UNIT-V

Other Transducers: Piezoelectric transducer - working principle, characteristics and applications, Piezoelectric accelerometers. Hall-effect sensors, Eddy current sensors, Fiber-optic sensors, Electro optic transducers - IC sensor for temperature and pressure, Aerospace sensors. Magneto resistive sensors, tomographic methods.

MEMs: Micro sensors, thermal, radiation, mechanical sensors, and NEMs.

Textbooks:

1. E.O.Doebelin, Measurement Systems - Application and Design, McGraw Hill, 1999.
2. Herman K.P.Neubert, Instrument Transducers - An Introduction to their performance and design, II Ed. Oxford University Press, 2003.

Reference books:

1. C.S.Rangan, G.R.Sharma, V.S.V.Mani, Instrumentation Devices and Systems, TMH, 2002.

2. Julian W. Gardner, Vijay K. Varadan, Microsensors, MEMS, Smart devices, John Wiley & Sons, 2001.

PAPER –3 Linear ICs and Applications

UNIT-I

Operational amplifiers: Ideal Op.Amps., Practical Op.Amps.,Internal structure, Open loop behavior, Op.Amp. parameters, DC performance, AC performance, Interpretation of data sheets, Inverting, non-inverting, DC, AC, differential amplifiers, Instrumentation amplifier, Bridge Amplifiers: Strain gage, bridge circuits for Measurement of small resistance changes and temperature, differentiators, integrators.

UNIT-II

Comparators, Voltage level detectors, Schmitt Triggers, linear half-wave rectifiers, precision rectifiers, peak detectors, Sample and Hold circuits, AC to DC converters, dead-zone circuits, Clippers, Clampers.

Filters: Design of I, II and higher order filters. Butterworth, Chebyshev, Low pass, High pass, Band pass, Wide band, Narrow band, notch filters, Universal filters.

UNIT-III

Waveform generation: Sine wave generation - Wein bridge, phase shift oscillators; Multivibrators, triangular wave generators, sawtooth wave generators, voltage to frequency and frequency to voltage converters, voltage controlled oscillators.

Multiplier: Analog multipliers, Applications of multipliers - Division, Square, square root, frequency doubler, rectifier and Phase shift detector circuits; Amplitude, Frequency, Pulse width modulation circuits, Demodulation.

UNIT-IV

PLL: Operating principles, functional blocks of PLL, stability analysis, Lock and Capture ranges, Applications of PLL - PLL as FM detector, FSK demodulator, AM detector, Frequency translator, Phase shifter, Tracking filter, Signal synchronizer, Frequency Synthesizer.

555 Timer: Functional block diagram, terminals, modes of operation, and applications.

UNIT-V

DAC: Principles – weighted-resistor network, R-2R ladder network, Current output DAC, MDAC, Specifications,

ADC: Single slope, Dual slope Integration type ADC, Successive approximation ADCs, Flash converters.

IC voltage regulators: Different types

Textbooks:

1. Operational amplifiers and Linear integrated circuits - Coughlin, Driscoll, IVEd., PHI, 1992.
2.Op-Amps and Linear Integrated Circuits, Ramakant A.Gayakwad, II Ed., PHI, 1991.
3. Integrated Electronics, Millman & Halkias, Prentice Hall, 1999.
4. Digital Principles & Applications, A. P. Malvino & D. P. Leach, TMH, IV Ed. 2002.

Reference books:

1. Integrated Circuits - K.R.Botkar, Khannan Publishers, 1991.
2. Applications of Analog ICs - Sidney Soclof, PHI, 1990.
3. Linear integrated circuits – Roy Choudhry, New Age International, 1998.

PAPER –4 Microprocessors and Microcontroller

UNIT-I 8085 Microprocessor

Architecture: 8085 internal architecture, instruction format, addressing modes, instruction set, stacks, subroutines, programming examples, pins and signals, various machine cycles, timing diagrams, estimation of execution times. Parallel I/O: Memory interfacing, I/O interfacing, decoding circuits, memory mapped I/O, I/O mapped I/O. Data Transfer schemes: programmed I/O.

UNIT-II

Interrupt structure in 8085, Interrupt driven I/O, DMA - principles. Peripheral interfacing: Internal blocks, pins and signals, operation, interfacing, and application examples for 8255PPI, 8253 Timer/Counter, 8259APIC, 8237 DMA controller. Interfacing matrix keyboard, switches, LED, ADC, DAC. Serial I/O: Basic concepts, Asynchronous and synchronous communication, communication through SID and SOD lines, 8251 USART Interfacing, examples.

UNIT-III 8086 Microprocessor

8086 family, 8086 Internal Architecture, Addressing modes, 8086 Instruction set, assemblers, programming examples, procedures and passing parameters between procedures. 8086 pins and signals, bus cycles, Minimum/Maximum mode operation. 8086 based system design: System components - bus controller, clock generator, address decoding, bus buffering and demultiplexing. Memory devices, memory controller, memory interfacing.

UNIT-IV

I/O interfacing, Interfacing peripheral I/O devices and matrix keyboard, stepper motor, DAC and ADC interfacing. 8086 interrupts - Interrupt types, response, procedures, and applications; DMA principles; UART NS16550D - interfacing, programming and applications.

Advanced microprocessors

Protected mode operation, Virtual memory, Mulitasking, Special features and overviews of 80286, 80386, 80486, Pentium, Pentium MMX, Pentium Pro, Pentium-II and Pentium-IV processors.

Microcontroller - Intel 8051:

Architecture – hardware features, registers, I/O ports, external memory, counter and timers, serial I/O, interrupts.

UNIT-V

8051 Programming: Instruction set, addressing modes, data transfer, logical, arithmetic operations, jump/call instructions, interrupt handler.
8051 system: System design & testing, generating software and hardware time delays, look-up tables, Serial communication: configurations, modes, programs.
Interrupt Programming: Timer interrupts, External hardware interrupts, serial communication interrupts. 8051 programming in ‘C’.

Textbooks:

1. Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with the 8085,
2. N.Mathivanan, Microprocessors, PC Hardware and Interfacing, PHI, 2005.
3. Muhammad Ali Mazidi, Janice Gillispie Mazidi, The 8051 microcontroller and embedded systems, Pearson education, 2001.
4. Kenneth J. Ayala, The 8051 Microcontroller – Architecture, Programming & Applications, II Ed., Penram International, 1996.
5. P.S. Manoharan, P. S. Kannan, Microcontroller based system design, SCITECH, Hyderabad, (2005).

Reference books:

1. D.V. Hall, Microprocessors and Interfacing: Programming and Hardware, II Ed., McGraw Hill, 1999.
2. Bary B. Brey, The INTEL Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, and Pentium Pro processors, IV Ed., PHI, 2002.
3. Kenneth J. Ayala, 8086 Microprocessor, Programming & Interfacing the PC, Penram International, 1995.

PAPER –5 Principles of Communication

Unit I

Spectral analysis and random process

Spectral characteristics of periodic and aperiodic signals. Spectra of common signals related to communication. Cross correlation, auto correlation and power/energy density spectra. Ramdom signals and process, modeling noises.

Unit II

Analog modulation systems

Basic principles of A.M., F.M. and P.M. – spectra power consideration, receivers characteristics and deduction of A.M. F.M. and P.M. systems performance. Threshold effects reduction.

Unit III

Base band data communication

Sampling and quantization, PCM, ADPCM, DM, ADM, base band pulse shaping, binary data formats, base band transmission – ISI, correlative coding, optimum SNR – matched filter detection.

Unit IV

Digital Modulation

Digital modulation – coherent binary modulation techniques, coherent quardrature modulation techniques, non-coherent binary modulation. M-array modulation, performance of digital modulation systems based on probability of error, bandwidth, ISI.

Spread spectrum techniques

Fundamentals concepts, direct sequence spread spectrum and frequency hopping spread spectrum.

Unit V

Microwave communication: Need for Microwave transmission, CCIR Standards of different microwave systems like, line of sight, over the horizon, troposcatter links. Principles of RADAR – types – CW, FMCW, pulse-doppler and MTI – RADAR, transmitter and receiver.

Text

1. Taub and Schilling, Principles of Communications, Tata McGraw Hill Publications, 1990.
2. Simon Haykins, Principles of Communications, PHI, 1990.
3. Kennedy, Davis, Electronic Communication Systems, TMA, IV Ed., 1999.

References

1. B.P. Lathi, Analog and digital communication systems, PHI 1992.
2. Proakis, Digital Communication, McGraw Hill, 1992.
3. A.B. Carlson, Communication Systems, McGraw Hill Publications, 1992.

PAPER –6 Control Systems

UNIT-I

Basic control systems with examples – Open loop and closed loop system, Basic elements in control system – Methods of analysis of physical system, linearizing of system.

Representing control system: Differential equations, transfer function, Block diagram – Classification, Transfer functions of DC and AC servomotors, PID controller, Block diagram, simplification methods, signal flow graphs

UNIT-II

Time domain analysis: Time response, time domain specifications, types of test inputs, I and II order system responses, error coefficients, steady state error, Poles and Zeros, relationship between poles and zeros in the s-plane, corresponding responses in time and frequency domain

UNIT-III

Frequency domain analysis: Polar plot, concepts and constructions of Bode plot, plotting Bode-plots, Stability analysis and system analysis using Bode-plots, Closed loop response from open loop response, constant M&N circles – Niochol's chart, Time domain versus frequency domain analysis.

UNIT-IV

Stability: Characteristic equation – location of roots in s-plane for stability, Routh-Hurwitz criterion, Root-Locus technique, construction, Nyquist stability criterion, phase margin and gain margin.

UNIT-V

State and state variables – Physical, phase and canonical variables, state equation, State transition matrix and its solution, Eigen values and vectors – controllability, observability

TEXT

1. Control Systems Engineering, Nagarath and Gopal, II Ed., Wiley Eastern, 2002.
2. Modern Control Engineering, K.Ogata, PHI, 2002.
3. Automatic Control Systems, B.Kuo, PHI, 1991
4. Analog and Digital Control Systems, R. Gayakward, Prentice Hall International, 1988.
5. Integrated Electronics, Millman & Halkias, Prentice Hall, 1999.

PAPER –7 Computer Architecture

Unit I

Introduction

Evolution of computers generations of computers – basics of computer architecture - stored programme organization (Von Neumann architecture) – instruction formats and types – addressing modes – stack organization.

Unit II

Processor design

Processor basis – CPU organization – data representation – instruction set – data path design – fixed point arithmetic – ALU – floating point arithmetic - control design - basic concepts - hard wired control – micro programmed control – piper line control.

Unit III

Memory and I/O systems

Memory technology – memory systems – virtual memory – high speed memories – interleaved memories – Caches – design methods - associative memories – input/output systems – programmed I/O, DMA and interrupts – I/O processors

Unit IV

Parallel processing

Parallelism in uni processor system – parallel computer structure – architectural classification schemes – pipe lining – instruction and arithmetic pipelining- principles of designing pipelined processors-vector processing requirements.

Unit V

Advanced computer architecture:

RISC machines-design principles-RISC versus CISC- example RISC architecture SPARC-static and dynamic data flow design-fault tolerant computers.

Text

1. John P. Hayes, Computer architecture and organization, 3rd Edn. McGraw Hill, 1998
2. Zvonko G. Varensic, G. Zally, Hamachar, Computer Organization, 4th Edn. McGraw Hill 1996

References

1. Andrew S. Tanenbaum, Structured computer organization, PHI 1990
2. M.M. Mano, Computer system architecture, PHI 1992
3. Kai Hwang and Faye A. Briggs, computer architecture and parallel processing, McGraw Hill 1985.

PAPER –8 Digital Signal Processing

UNIT-I

Discrete-Time Signals and Systems: Discrete-Time Signals-Sequences, Frequency-Domain representation, Symmetry Properties of Fourier Transform, Sampling of Continuous-Time Signals, Two Dimensional sequences and systems

The z-Transform: z-transform, inverse transform, theorems and properties, system function, two-dimensional z-transform.

UNIT-II

Discrete Fourier Transform: Discrete Fourier series, properties of DFS, sampling the z-transform, discrete Fourier transform, properties of DFT, linear convolution using DFT, two-dimensional DFT.

UNIT-III

Flow Graph and Matrix representation of Digital Filters: Signal flow graph, matrix representation of digital networks, basic network structures for IIR, FIR systems, parameter quantization effects, Tellegen's theorem for digital filters.

UNIT-IV

Digital Filter Design Techniques: Design of IIR Digital Filters from Analog filters, Design Examples - Analog Digital Transformation, Design of FIR filters, Computer Aided design of IIR, FIR filters.

UNIT-V

Computation of DFT: Goertzel Algorithm, Decimation-in-Time FFT algorithm, Decimation-in-frequency FFT algorithm, FFT algorithm for N a composite number, General Computational Consideration in FFT algorithm, Chirp z-Transform.

Architecture and features of TMS320C50, Applications of DSP - Spectral Analysis

Text

1. Alan V.Oppenheim and Ronald W.Schafer, Digital Signal Processing, PHI, 1991
2. John G. Proakis, Dimitris G. Manolakis, Digital Signal Processing – Principles algorithms and applications, III Ed., PHI, 2003.

Reference

1. Digital signal processing, A computer based approach, Sanjit K.Mitra, TMH, 1998
2. Introduction to digital signal processing, Johnny R.Johnson, PHI, 1992.
3. Biomedical digital signal processing, W.J.Tompkins, Prentice Hall, 1992.
4. B.P. Lathi, Analog and digital communication systems, PHI 1992.

PAPER-9 Fiber Optics Communication

Unit I

Dielectric waveguides:

Basic optical communication system, parameters, SI, GI, MM and SM fibers, modes and rays, multipath, dispersion, material dispersion attenuation mechanism, absorption and scattering in fibers.

Unit II

Wave propagation in SI and GI fibers

Power density distribution, intermode and intra mode dispersion, SM fiber, DSF, DFF fibers, mode spot size, He11 mode propagation characteristics.

Unit III

Sources and detectors

Choice of semiconductors, intrinsic and impurity semiconductors, injection luminescence, efficiency, hetero junctions and properties, LEDs-SLED and ELED, coupling mechanism, LDs-conditions for laser action-gain co-efficient, modulation frequency response QW and DFB lasers, detector diodes, PIN-APD-materials, impulse and frequency response, parameters.

Unit IV

Receiver amplifiers

Source of noise, SNR calculations in voltage – amplifier and transimpedance amplifier, regeneration of signals, ISI and eye diagram, effects of noises on error probability.

Unit V

Unguided and guided communication systems

Transmission parameters, beam divergence and attenuation, sources and detectors, merits of fibers in telecommunication, LAN and computer networks, digital fiber optic communication system.

Text

1. Gowar, "Optical communication systems" Prentice Hall, 1998.

Reference

1. J.Senio, 'optical communications,Principles and practice', PHI,1994.
2. Keiser, Optical Fiber Communications, McGraw Hills, 1991.
3. Allared ed. Fiber Optic Hand book for Engineers and Scientists, McGraw Hill 1990.

PAPER-10 Computer Networks

Unit I

Computer communication architecture: network topology, switching: circuit switching and packet switching, datagrams and virtual circuits, ISO reference modal for layered architecture, functions of various layers.

Unit II

Local area network: objectives and advantages of PC LANs, topologies for LANs, media for LANs and medium access control techniques: CSMA, CSMA/CD, token bus and token ring, performance analysis for LANs.
Wide Area Network.

Unit III

Internet working: basic principles, bridges and routers, connection oriented and connectionless internet working. Introduction to the protocols in the TCP/IP protocol suite.

Unit IV

ISDN and B- ISDN, frame relay and asynchronous transfer mode. Data compression. Data security and authentication techniques.

Unit V

Network management, electrical mail, network security, other internet applications. Test techniques for data networks: basic test, transmission impairment measurement test, time domain reflectometry (TDR). Line monitors and protocol analyzer.
Automation fieldbus networks: Fieldbus basics, Characteristics, requirements, overview.

Text

1. W. Stalling, Data and computer communication, 5th Edn., PHI, New Delhi, 1997.
2. William Stalling, High-speed networks-TCP/IP and ATM design principles, Prentice Hall, New Jersey, 1998.
3. Richard H. Baker, Network security-how to plan for it and achieve it, McGraw Hill Inc., New York, 1995.

References

1. Ed Taylor, McGraw Hill Internetworking Handbook, 2nd Edn. McGraw Hill, New York, 1998.
2. Bertsekas D and Gallager R. Data networks, 2nd Edn. PHI, New Delhi, 1992
3. Viswanathan T. Telecommunication switching systems and networks, PHI, New Delhi, 1992.
4. Ed Tittel and Margaret Robbins, Internet Access Essentials, Academic Press Inc., New York, 1995.

PAPER-11 Data Communication

Unit-ISource coding:

Review of sampling theorem-Practical aspects of sampling-quantization of analog signals-Spectra of Quantizations-wave from coding- PCM, ADPCM,Delta modulation-ADM-Bit rate and SNR-calculation-Mean and prediction coding.

Unit-II Data communications:

Base band shaping, binary Data formats,NRZ,RZ,Manchester formats-Baseband transmission-ISI-correlative coding Eye Pattern-Adaptive equalization for data transmission data reception matched filter, Optimum SNR.

Unit-III Error control coding:

Introduction linear block codes-cyclic codes-Burst error detecting and correcting codes-Decoding algorithms of convolution codes-ARQ codes performance of codes.

Unit-IVDigital Modulation Methods:

Digital modulation formats- coherent binary modulation techniques- coherent Quadrature
Modulation techniques – Non-coherent binary modulation - M-array modulation techniques.
Effect of ISI, Synchronization-application.

Unit-V Spread Spectrum modulation:

Introduction –direct sequence –spread spectrum-use of spread spectrum with code division multiple access(CDMA) –frequency hopped spread spectrum- application.

Text:

1.Haykin, “Digital Communication”, John Wiley& sons,1998.
2.John G.Proakkis, “ Digital communication” ,Mc Graw Hill Inc ,Third edition , Malaysia,1995.
3.Taub & Schilling,” Principles of communication systems” Tata Mc Graw Hill Co., India, 1986.

Reference:

1.Sam.K.Shanmugam , “Digital & analog communication systems”, John Wiley& sons,1984.
2.Wayne Tanasi “ Advanced electronic communication systems”, fourth edition, Prentice Hall Inc ,New jerky,1998.
3.Lee.E.A. and Messer schmitt ,”Digital communications”, Allied publishers, New Delhi,2nd edition ,1994.
4.M.K.Simen,” Digital Communications Techniques Signal Design & Detection”, PHI ,1999.

PAPER-12 Medical Electronics

Unit I

Bioelectric signals: origin – recording and monitoring display – patient monitoring – telemetry computer application – safety

Unit II

Measurement and analysis: electromagnetic - ultrasonic – nuclear magnetic resonance- laser Doppler – oxiometer – audiometer.

Unit III

Diagnostic equipment principles – electro cardiograph – phono cardiograph – electro myo graph – electroencephalograph

Unit IV

Therapeutic equipment principles cardiac pacemakers – Defribrillators,– dialysors – physiotherapy and electro therapy

Unit V

Modern imaging – X-ray machine- X-ray CT scanner – MRI – Ultrasonic thermography, Image reconstruction.

Text

1. R.S. Khandpur, Hand book biomedial instrumentation. McGraw Hill, 1990
2. Leslle Cromwell, Fred J. Weibell and Erich A. Prelffer, Biomedical instrumentation and measurements, 2nd Edn, PHI ,1996.
3. Cooper, Ossciton and Shaw, EEG Technology, 3rd Edn. Butterworths, 1980.

References

1. Heinz Kresse, Handbook of electro medicine, John Wiley and Sons Chichester, 1985.
2. Alber, M. Cook and Webster J.G. Therapeutic Medical devices, PHI, New Jersy, 1982.

PRACTICALS-1

Microprocessor and Micro controller Lab

I. Writing 8085 ALP and testing with microprocessor trainer kits:

1. Block Move
2. Addition, subtraction, multiplication, logical operations
3. Rearranging the Numbers - ascending/descending order
4. String Manipulation - password, palindrome testing.
5. Simple Series Generation
6. Use of Look up Tables
7. LCF, GCM
8. Code Conversion - BCD to Binary, Binary to BCD, Binary to GRAY etc.

II. Hardware and software for interfacing:

1. ADC, DAC
2. Stepper Motor
3. Keyboard
4. Seven Segment LED Display

III. Writing and testing 8086 ALP using MASM

1. Finding Largest/Smallest, Rearranging in ascending/descending order.
2. String Manipulation - Block Move, Palindrome/Pass word testing.
3. Matrix Multiplication.
4. LCM, GCF, Code Conversion etc.

IV. Microcontroller lab

Programming exercises with 8051 microcontroller trainer kits:

1. Writing and testing programs involving arithmetic, logical and BIT manipulations instructions.
2. Programming and verifying timer operation.
3. Programs for measuring frequency using input capture and output compare mechanism.
4. Programming using interrupts
5. Programming and verifying UART of the microcontroller

PRACTICALS-2

Linear ICs lab:

1. Op-amp circuits:

   Inverter, Non-Inverter, Instrumentation Amplifiers, Integrator, Differntiator

2 Design of Filters: Low Pass, High Pass

3 Oscillator Circuits:

   Wein Bridge, Phase Shift, Square Wave

4. Power Supply circuits: Constant Current source

5. ADC and DAC circuits

6.555 Timer application circuits

7.SCR, UJT, Triac application circuits

Communication laboratory

1. Amplitude modulation and demodulation
2. Frequency modulation and demodulation
3. Phase lock and frequency synthesizer
4. AM receiver characteristics
5. Pulse modulation
6. Sampling and time division multiplexing

PRACTICALS 3

Digital Signal Processing Laboratory

Writing and testing programs with DSP trainer kits

Convolution, Correlation
FIR & IIR Filter implementation
FFT, DFT
Quantization noise
Adaptive filters

MATLAB programs

MATLAB programming – basics: matrix multiplication, solving equations, plotting curves
Signals and systems: Generation of series, functions for shifting, adding, multiplying, folding
Programs for: convolution, correlation, FFT, etc.

Programs for other DSP problems
Experiments with spectrum analyzers

PRACTICALS-4

DIGITAL COMMUNICATION LAB

1. Pulse code modulation
2. Delta modulation
3. ASK Transmission and Reception
4. PSK Generation and Detection
5. Quadrature phase shift keying
6. Differential phase shift keying
7. Uniform Quantizer
8. Matched Filter
9. Gold sequence generation
10. Scrambler & un scrambler
11. Cyclic codes
12. Convolutional codes
13. Direct sequence spread spectrum