SYLLABUS

B.Sc.
ELECTRONICS

CSJM UNIVERSITY, KANPUR

SYLLABUS

B.Sc. - I (ELECTRONICS)
CSJM UNIVERSITY, KANPUR

THEORY PAPERS

FIRST PAPER	Basic Electronics & Instrumentation	50
SECOND PAPER	Fundamentals of Analog and Digital System	50
THIRD PAPER	Electronic Devices	50
	TOTAL	**150**

PRACTICAL

A.	Experiment-I (Basic Electronics)	10
B.	Experiment-II (Digital Electronics	10
C.	Project Work + Record File	20
D.	Viva Voce and Overall Presentation	10
	TOTAL	**50**
	G. TOTAL	**200**

SYLLABUS

B.Sc.-I (ELECTRONICS)

PAPER- I

Basic Electronics & Instrumentation

Max. Marks-50

Unit - 1

Review of passive components, Growth and Decay of current, time constant in inductive circuit with charging and discharging of capacitor through resistance and inductance.

Kirchhoff's laws. Node analysis, Mesh analysis, T and II network, Star- Delta Transformation, Thevenin's theorems, Norton's theorem, Reciprocity theorem. Superposition theorem, Millman's theorem, Maximum power transfer theorem.

Unit – 2

AC circuit analysis:- Sinusoidal voltage and current, definition of instantaneous, peak root mean square and average values. Voltage current relationship in resistor, Inductor, Capacitor, Phasor, Complex impedance, power in Ac circuits:- instantaneous power average,. Power reactive . Power factor. Sinusoidal circuit analyses for R-L, R-C, R-L-C circuits. Resonance in series and Parallel/ R-L-C. circuits, frequency response of Series and Parallel/ R-L-C circuits. Quality (Q) factor and band width. Passive filters:- low, high and Band pass filters.

Unit – 3

Basic features of magnetically coupled circuits, coefficients coupling transformer. Ideal transformer, Equivalent circuits of transformer, Approximate voltage drop in transformer. Voltage regulation losses, Efficiency in transformer.

Unit-4

Bridge Measurements:- General condition of balance in impedance, Maxwell, Schering and weinbridge for measurements of inductance capacitance and frequency.

The Cathode Ray Oscilloscope (CRO), Block Diagrams of General purpose oscilloscope and its basic operation. electrostatic focusing and deflection, Screen for CRT . CRT connections, CRO Probes Types of CRO:- dual trace osciloscope., digital storage CRO, Multimeter and V.T.V.M. Transducers, Classification of transducers, characteristics of transducers their uses in measurements of physical quantities and instrumentations.

SUGGESTED BOOKS

1. Roberts L. Boylestad. Essentials of circuits analysis. Pearson Education (2004)
2. John D Ryder, Network lines and fields prentice Hall of India (2002)
3. H.S. Kalsi, Electronoc Instrumentations, Tata McGraw Hill (2006)
4. A.K. Sawhney, Electronic Measurements and Instrumentation, Dhanpat Rai & Co.

SYLLABUS

B.Sc.-I (ELECTRONICS)

PAPER- II
Fundamentals of Analog and Digital System

Max. Marks-50

Unit - 1

Basic Operational Amplifier: Concept of differential amplifiers, block diagram of an operational amplifier(IC741),

Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance,input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio.

Op-Amp in open and closed loop configuration: Frequency response of an op-amp in open loop and closed loop configurations, inverting, Non-inverting, summing and difference amplifier, Integrator, differentiator, voltage to current converter, current to voltage converter.

Unit - 2

Number system and codes. Decimal, Binary, Hexadecimal, Octal, conversions of one code to another, complements (One's and two's), Signed and Unsigned number. Addition and subtraction multiplication. Gray and Hamming codes, Logic gates and Boolean algebra.: Truth table,. OR, AND, NOT, XOR, XNOR, Universal, (NOR and Nandigates.) Boolean theorems, De-Morgan theorems Principal of duality, Digital logic families. Fanin and Fanout, noise margin, power dissipation, figure of merit, current and voltage parameter ,RTL, DTL, TTL,ECL,HTL,MOS,CMOS.

Unit - 3

Combinational logic analysis and design : Standard representation of logic functions (SOP and POS), Karnaugh map minimization, Quine McCluskey minimization.Multiplexers(2:1,4:1) and Dempultiplexers (1:2,4:1), Implementing logic functions with multiplexer, Adder (half and full) and subtractor, Encoder (8 to 3)and Decoder(3 to 8)

Unit - 4

Sequential logic design: Latch, Flip Flop (F.F.), S-R, J-K, F.F and T and D type F.F's, Clocked FFs, Registers, Counter (ripple synchronous and asynchronous) state table, state diagrams and sequential machines .

A/D and D/A Converters successive approximation ADC,R/2R, Ladder DAC

Memories : General memory operation, ROM, RAM (static and Dynamic) PROM ,EPROM, EAPROM .

SUGGESTED BOOKS

1. Modern Digital Electronics: R.P. Jain, 3rd edition .TMH Publications.
2. Digital Fundamentals: Floyd, CBS Publishers.
3. R.A. Gayakwad, Op-Amps and Linear IC' s, Pearson Education (2003)
4. R.L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw-Hill(1994)
5. Donald P. Leach, Albert paul Malvino, Digital Principles and Applications, Tata McGraw Hill(1995)
6. M.Morris Mano, Michael D.Ciletti, Digital Desing, Pearson Education Asia, (2007)
7. Thoms L. Floyd, Digital Fundamentals, Pearson Education Asia(1994)
8. S.P. Bali, Solved Problems in Digital Electronic, Sigma Series, Tata McGraw-Hill,(2005)
9. W.H. Gothmann, Digital Electronics': An Introduction To Theory and Prentice Hall of India (2000)

SYLLABUS

B.Sc.-I (ELECTRONICS)

PAPER- III

Electronic Devices

Max. Marks-50

Unit-1

Vacuum tube Devices and Gas Filled Tubes. Basic Idea about thermoionic emission from metals, vacuum tubes and their characteristics, space charge effects, load line and inter electrode capacitance, secondary emission. variable tube and beam power tube.

Hot cathode and cold cathode diodes, thyratrons, ignitrons, VR tubes and their applications.

Unit- 2

Semiconductor Basics : Energy band in solids (metal, semiconductor and insulators), concept of effective mass, density of states, carrier concentration at normal equilibrium in intrinsic semiconductors, derivation of Fermi level for intrinsic semiconductors, donors, acceptor, majority carriers (electrons and holes), dependence of Fermi level on temperature and doping concentration.

Diode : p-n junction diode, formation of depletion layer, space charge at a junction. derivation of electrostatic potential difference at thermal equilibrium, depletion width and depletion capacitance of abrupt p-n junction, diode equations and the I-V characteristic, Zener and avalanche mechanism, Zener diode.

Unit- 3

Metal Semiconductor Junction : Ohmic & Rectifying Contacts.

Bipolar Junction Transistor (BJT) : PNP and NPN transistor, basic transistor action, energy band diagram of transistor in thermal equilibrium, early effect, input and output characteristics of CB, CE and CC configurations.

Uni-junction Transistor (UJT) : Construction, working and I-V characteristics of UJT.

Thyristor Devices : Basic construction and Characteristics of Thyristor, Semiconductor Controlled Device(SCR), Characteristic and two transistor model of SCR.

Unit- 4

Field Effect Transistor (FET) : Construction of JFEET, idea of channel formation, pinch- off voltage, Transfer and output characteristics.

MOSFET : MOS Diode, Basic construction of MOSFET and working, I-V characteristics, enhancement and depletion modes, Complimentary MOS (CMOS).

SUGGESTED BOOKS

1. S.M.Sze, Semiconductor Devices : Physics and Technology, John wiley & Sons (2002)
2. Ben Streetman and S.Banerjee, Solid State Electronic Devices, Pearson Education (2006)
3. Jasprit Singh, Semiconductor Devices : Basic Principles, John Wiley and Sons (2001)
4. Kanaan Kano, Semiconductor Devices, Pearson Education (2004)
5. Robert F. Pierret, Semiconductor Devices Fundamental, Pearson Education (2006)
6. Dennis Le Croissette, Transistors, Pearson Education (1989)

B.Sc.-I

LAB Assignments

1. Introduction to basic components Resistor, Capacitor, Inductor, Diode, Transistor and ICs.
2. Familiarization with CRO, Calibration of X and Y axis measurements of voltage.
3. Measurements of
   a. Frequency
   b. Phase
   c. Current
   d. Resistance using CRO
4. Familiarization and to study characteristics of Multimeter/ VTVM
5. Find an equivalent T Network for a Four terminal unknown T network measuring input and output impedances
6. Study of Resonant circuit and determination of sharpness resonance and Bandwidth
7. Study of R-C, R-C-L circuit using DC source. Plotting growth and Decay of currents time constant etc.
8. Study of PN Junction Diode as a Rectifier.
9. Study of Integrated and Differentiated shape using RC circuits.
10. Study of characteristics of operational Amplifier.
11. Study of a Parameter of transistor.
12. To verify and design AND, OR, NOT, XOR gates using NAND gates.
13. Design Half Adder and Full Adder.
14. Design Half and Full Subtractor.
15. To design Digital to Analog and Analog to Digital Convertor.
16. Design a Shift Register from D/T/JK Flip flop. Study Serial and Parallel Shifting data.
17. To study Thevennin's Theorem, Norton Theorem, Superposition Maximum Power Transfer Theorem.

SYLLABUS

B.Sc. -II (ELECTRONICS)
CSJM UNIVERSITY, KANPUR

THEORY PAPERS

FIRST PAPER	Semiconductor Devices & Applications	50
SECOND PAPER	Microprocessors and Microcontrollers	50
THIRD PAPER	Analog Communication	50
	TOTAL	**150**

PRACTICAL

A.	Experiment-I	10
B.	Experiment-II	10
C.	Project Work + Record File	20
D.	Viva Voce and Overall Presentation	10
	TOTAL	**50**
	G. TOTAL	**200**

SYLLABUS

B.Sc. - II (ELECTRONICS)

PAPER- I
Semiconductor Devices and Applications

Max. Marks-50

Unit- 1

Diode circuits: Ideal diode, piecewise linear equivalent circuit, dc load line analysis, Quiescent (Q) point, Positive, negative and biased clipper circuits, clamping circuits, Half wave rectifier, center tapped and bridge fullwave rectifiers, calculation of efficiency and ripple factor.

DC power supply: Block diagram of a power supply, qualitative description of shunt capacitor filter, Zener diode as voltage regulator, temperature coefficient of Zener diode.

Unit- 2

The BJT: Transistor current components and amplification, Transistor configurations: common base (CB), Common emitter (CE) and Common Collector (CC) configuration, I-V characteristics and hybrid parameters, regions of operation, dc load line, Q point.

CE amplifier: Self bias arrangement of CE, dc and ac load line analysis, hybrid equivalent of CE, Quantitative study of the frequency response of CE amplifier, effect on gain and bandwidth for cascaded CE amplifier (RC coupled) RC coupling, direct coupling, transformer coupling and their comparision.

Power Amplifiers: Heat sink, Classification of power amplifiers: A, B, C and AB, analysis of Class B ingle tuned amplifiers.

Unit- 3

Feedback Amplifiers: Concept of feedback, negative and positive feedback, Negative feedback: advantages and disadvantages of negative feedback, voltage (series and shunt), current (series and shunt), feedback amplifiers, derivation of gain, input and output impedances for feedback amplifiers, Positive feedback: Barkhausen criteria for oscillations, tudy of phase shift oscillator and Colpitts oscillator. Colpitts Crystal oscillator.

Unit- 4

The MOSFET: The three configurations: Common Gate (CG), Common Source (CS) and Common Drain (CD), I-V characteristics, regions of operation, small signal equivalent circuit, dc load line, Q point.

CS amplifier: CS amplifier circuit analysis, Qualitative study of frequency response of CS amplifier.

SUGGESTED BOOKS

1. R. L. Boylestad, L. Nashelsky, K. L. Kishore, Electronic Devices and Circuit Theory, Pearson Education (2006).
2. D.L.Schillling and C. Belove, Electronic Circuits: Discrete and Integrated, Tata McGraw Hill (2002).
3. J.R.C. Jaegar and T.N. Blalock, Microelectronic Circuit Design, Tata McGraw Hill (2010).
4. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill (2002).
5. J. Millman and C.C. Halkias, Integrated Electronics, Tata McGraw Hill (2001).
6. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991).
7. R. A. Gayakwad, op-Amps and Linear IC'S, Pearson Education (2003).
8. S. Franco, Design with operational amplifiers and analog integrated circuits. Tata McGraw Hill (2002).
9. R. F. Coughlin and F.F. Driscoll, Operational amplifiers and linear integrated circuits, Pearson Education (2001)

SYLLABUS

B.Sc. - II (ELECTRONICS)

PAPER- II
Microprocessors and Microcontrollers

Max. Marks-50

Unit- 1

8086 Microprocessor: Internal architecture, Real mode memory addressing, Introduction to protected mode memory addressing, Memory Paging

Addressing modes: Data-Addressing modes, Program Memory-Addressing modes, Stack Memory- Addressing Modes.

Unit- 2

Programming 8086 using-

Data movement instruction: MOV, PUSH/POP, Load-Effective Address, String data transfers, miscellaneous data transfer instructions.

Arithmetic and Logics instructions: Addition, substraction and comparison, multiplication and division, BCD and ASCII arithmetic, Basic logic instructions, Shift and Rotate, String comparisons.

Program control instructions: Jump group, controlling the flow of an assembly language program, procedures, introduction to interrupts, Machine control and miscellaneous instructions

Interrupts: Basic interrupt processing, interrupt instructions, operation of real mode and protected mode interrupt, interrupt flag bits, Hardware interrupts, expanding the interrupt structure.

Unit- 3

Peripheral Devices: 8255- Programmable Peripheral Interface, 8253- Programmable interval Timer, 8259- Priority Interrupt Controller, 8279- Programmable Keyboard/Display Interface, 8251-USART, 8237/8257-Programmable DMA Controller.

Unit- 4

Other Microprocessors: Introduction to 80186/286/386/486 and Pentium microprocessors.

Introduction to Microcontrollers: Advantages and applications of Microcontrollers (8051).

SUGGESTED BOOKS

1. B. Brey, The Intel Microprocessors- Architecture, Programming and Interfacing, Pearson Education (2003)
2. D. V. Hall, Microprocessors and Interfacing- Programming and Hardware, Tata McGraw Hill (1999)

SYLLABUS

B.Sc. - II (ELECTRONICS)

PAPER- III
Analog Communication

Max. Marks-50

Unit- 1

Electromagnetic waves : their propagation in free space, electromagnetic spectrum. Propagation of radio waves : ground waves, space waves, through troposphere, Qualitative idea of different ionosphere layers and sky-wave propagation, skip distance, virtual height of a layer, maximum usable frequency.

Concept of noise: External noise, internal noise, signal to noise ratio, noise factor, noise temperature, Friss formula.

Unit- 2

Antennas: Wire and Aperture Antennas, the Retarded Potential, Hertzian Dipole. Power radiated, Radiation Resistance, Antenna Characteristics, Antenna Patterns. Radiation Intensity. Directive Gain. Power Gain. Effective Area and Friis Equation.

Some Practical Antennas: Half-wave Dipole Antenna, Quarter-wave Monopole Antenna, small Loop Antenna, Aperture Antenna, Antenna Arrays.

Unit -3

Amplitude modulation: Modulation index, frequency spectrum, generation of AM (balanced modulator, collector modulator), Amplitude Demodulation (diode detector, other forms of AM: Double side band suppressed carrier, DSCBC generation (Balanced modulator), Single side band suppressed carrier, SSBSC generation (Filter method, phase cancellation method, third method), SSB detection, Introduction to other forms of AM (Pilot carrier modulation, Vestigial side band modulation, Independent side band modulation.)

Unit- 4

Angle modulation: Frequency and phase modulation, modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM (Direct and indirect methods), FM detector (Slope detector, balanced slope detector, PLL). Comparison between AM, FM and PM.

Transmitters: Communication channels for AM and FM broadcast, AM transmitter: Low level and high level modulation, FM transmitter.

Receivers: Receiver parameters, sensitivity, selectivity and fidelity, Super Heterodyne receiver, Double Conversion Receiver, AM receivers, FM receivers.

Frequency division multiplexing.

SUGGESTED BOOKS

1. G. Kennedy and B. Davis, Electronic communication systems, Tata McGraw Hill (1999)
2. W. Tomasi, Electronic communication systems: Fundamentals through Advanced, Pearson Education (2007)
3. R. P. Singh and S. D. Sapre, Communication Systems: Analog and Digital, Tata McGraw Hill (2007)
4. L. E. Frenzel, Communication electronics: Principles and applications. Tata McGraw Hill (2002)
5. L. W. Couch II, Digital and analog communication systems, Pearson Education (2005)
6. T.G. Thomas and S. Chandra Sekhar, Communication theory, Tata McGraw Hill (2006)

B.Sc.-II

LAB Assignments

1. To study the I-V characteristics of Common Emitter configuration of BJT and obtain H parameters.
2. To study the I-V characteristics of the Common Base configuration of BJT and obtain H parameter.
3. To study the I-V characteristics of the common collector configuration of BJT and obtain H parameter.
4. To study the I-V characteristics of the UJT.
5. To study the I-V characteristics of the SCR.
6. To study the characteristics of FET.
7. To study the characteristics of MOSFET.
8. To study the characteristics of Feedback Amplifier Frequency Response Input Impedance.
9. To study of Amplitude Modulation and Demodulation.
10. To study of Frequency Modulation and Demodulation.
11. To write an assembly language program to transfer a block of data.
12. To write an assembly language program to add two-8 bit Hexadecimal numbers.
13. To write an assembly language program to multiply two-8 bit Hexadecimal numbers.
14. To write an assembly language program to add two-16 bit Hexadecimal numbers.
15. To write an assembly language program to generate Fibonacci series.
16. To write a language program to sort hexadecimal number in ascending order.
17. To write an assembly language program to sort hexadecimal number in descending order.
18. To find the nearest integer value of square root of an integer.
19. To study the working of IC 8255 (Integer Pacing Experiment)
20. To study the working of IC 8251 (Integer Pacing Experiment)

SYLLABUS

B.Sc. - III (ELECTRONICS)
CSJM UNIVERSITY, KANPUR

THEORY PAPERS

FIRST PAPER	Communication Electronics	75
SECOND PAPER	Radar Television & Microwave Engineering	75
THIRD PAPER	Numerical Analysis & Programming in C	75
	TOTAL	225

PRACTICAL

A.	Experiment-I	15
B.	Experiment-II	15
C.	Project Work	25
D.	Viva Voce	10
E.	Record	10
	TOTAL	75
	G. TOTAL	**300**

SYLLABUS

B.Sc. - III (ELECTRONICS)

PAPER- I
Communication Electronics

Max. Marks-75

Unit- 1

Transmission Lines: Typical transmission lines- Co-axial, Two Wire, Microstrip, Coplanar and Slot Lines, Description of Transmission Line Propagation, Transmission Line Parameters, Distributed Line Parameters at High Frequencies for Co-axial, Two Wire and Planor Lines.

Transmission Line Equations: Propagation of Sinusoidal Voltages, Complex Analysis of Sinusoidal Waves and Phasor, Characteristic Impedonce, Lossless, distortionless, low loss line, Wave Reflection at discontiniuties, Reflection Coefficient, Voltage Standing Wave Ratio, Input Impedence, Power, Shorted Line, Open-Circuited Line, Matched Line, Transmission Line Applications.

Unit- 2

Digital Communication : Sampling theorem, Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM), Pulse Width Modulation (PWM) and Pulse Position Modulation (PPM), Pulse Code Modulation , Differential Pulse Code Modualtion, Delta Modulation, Adaptive Delta Modulation.

Unit- 3

Digital Carrier Modulation Techniques: Block diagram of digital transmission and reception, Information capacity, Bit Rate and M-ray coding. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Binary Phase Shift Keying (BPSK).

Unit- 4

Satellite communication : Introduction, satellite orbits, Satellite system-Block diagram of satellite sub systems, up link, down link, cross link, transponders (C-band) (space segment). Ground station (simplified Block diagram of earth station). Multiple access methods-TDMA,FDMA, CDMA, GPS-service's link SPS & PPS.

Optical Fiber Communication: Introduction, Need for OFC, Block diagram of OFC system, Fiber optic cables, Light propagation through fiber. Expression for NA (no derivation). Types of Light sources and Detectors. Losses in OFC. Advantages and Disadvantages of OFC over metallic cables.

SUGGESTED BOOKS

1. H. Taub and D. Schilling, Principles of Communication Systems, Tata McGraw-Hill (1999)
2. W. Tomasi, Electronic Communication Systems: Fundamental through Advanced, Pearson Education (2004)
3. L.E. Frenzel, Communication Electronics, Principle and Applications, Tata Mcgraw-Hill (2002)
4. L.W. Couch II, Digital and Analog Communication Systems, Pearson Education (2005)
5. H.P.Hsu, Analog and Digital Communication, Tata McGraw-Hill (2006)
6. S.Haykin, Communication Systems, Wiley India (2006)

SYLLABUS

B.Sc.-III (ELECTRONICS)

PAPER- II

Radar, Television and Microwave Engineering

Max. Marks-75

Unit -1

Radar Engineering: Pulsed radar system, range equation. Parameters affecting the maximum range of radar, noise figure, radar antenna and scanning and tracking, display system, P.P.I. and M.T.I. (Block diagram discussion), Radar range equation, C.W. and Frequency Modulation, CW radar, Phased array radar. Pulse compressed radar, Radar used to navigation, duplexer.

Unit-2

Television Engineering: Monochrome T.V. Camera Tube: image orthicon, vidicon, plumbicon, Theory of scanning, interlaced scanning, blinking and synchronizing pulses. Block diagram discussion of a T.V. transmitter. T.V. picture vertical and horizontal deflection systems. Block-diagram discussion of T.V. receiver, receiving antenna and T.V. Channel.

Unit-3

Basic concept of colour transmission in T.V. systems, colour T.V. transmitter and receiver, block diagrams Primary and Secondary colours, Colour combinations, chromo and Luminace Processing as per PAL system. Colour TV receiver (PAL), Colour picture tube and its requirements.

Unit-4

Microwave Engineering : Klystron magnetron and Gun effect devices, Microwave Components. Microwave. measurements and applications of microwave.

SUGGESTED BOOKS

1. Electronic Communication, George Kennedy, 3rd Edition, TMH
2. Electronic Communication, Roddy and Coolen, 4th Edition, PHI

SYLLABUS

B.Sc.-III (ELECTRONICS)

PAPER- III

Numerical Analysis & Programming in C

Max. Marks-75

Unit -1

Numerical Analysis: Methods of solving numerical problems, eg. Regulafalsi and Newton Rephson method, trapezoidal rule and simpson rules. Euler's method for first order ordinary differential equations. Gauss and Gauss seidal elimination methods for simultaneous linear equations. Matrix-inversion elimination methods for homogeneous equations.

Unit-2

C Programming : Introduction, Importance of C, Character set, Tokens, keywords, identifier , constants, basic data types, variables: declaration & assigning values. Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators conditional operators, bit wise operators, expressions and evaluation of expressions, type cast operator, implicit conversions, precedence of operators. Input-output statements(printf(), scanf() & getch()and library functions (math and string related functions).

Decision making, branching and looping : Decision making- Simple if, if-else, nested if, switch-case statement, Looping-for loop, while loop and do-while loop. (Structure of C program and example programs).

Unit-3

Decision making- Simple if, if–else nested if, switch-case statement, looping- for loop, while loop, and do-while loop (Structure of C program and example programs)

Unit-4

Functions and Pointers: Call by reference, call by value, passing array and structure to function, function returning pointers, character pointer, two-dimensional array of string, array of pointer to string, passing structure pointer to functions.

SUGGESTED BOOKS

1. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.

B.Sc.-III

LAB Assignments

1. Study of Pulse Amplitude Modulation
2. Study of Pulse Width Modulation
3. Study of Pulse Position Modulation
4. Study of Delta Modulation
5. Study of Pulse Code Modulation
6. Study of Phase Shift Keying
7. Study of Frequency Shift Keying
8. Study of Time Division Multiplexing

C Programming

1. To generate the Fibonacci series upto the given limit N and also print the number of elements in the series.
2. To find minimum and maximum of N Numbers using Array.
3. To find the GCD of two integer numbers.
4. To calculate Factorial of given numbers using Function.
5. To find all the roots of quadratic equation $Ax^2 + Bx + C=0$ for non-zero coefficient A, B and C. Also report error.
6. To calculate the values of Sin(x) and Cos(x) using the series. Also print Sin(x) and Cos(x) value using library functions.
7. To generate and print Prime numbers upto an integer N.
8. To find the sum and difference of two Matrix of order MxN and PxQ
9. To find the product of two Matrix of order MxN and PxQ
10. To find the sum of Principle and Secondary diagonal element of the given Matrix MxN and PxQ
11. To copy the contents of one string to another string using a pointer method.
12. To construct a Stack using a linear linked list and to implement the push( ) and pop( ) operations.
13. To read a set of structures elements from the keyboard and to store it on to a specified file and again to read the same file and to display the contents of the file.
14. To create a binary tree and to display the contents of the tree using inorder tree traversal method
15. To construct a doubly linked list to add and to delete an item.