The University of Burdwan
Syllabus for B.Sc. Honours
(1+1+1 Pattern)
in
Electronics
with effect from 2014-2015

STRUCTURE OF THE SYLLABUS

Part – I (First Year) Full Marks – 200

Theoretical:

Paper – I	Full Marks: 100	Group A:	Mathematical Methods
		Group B:	Mechanics (Classical and Quantum), Thermal Physics
Paper- II	Full Marks: 50		Circuit Theory and Active devices

Practical:

Paper – III	Full Marks: 50		Experiments on Network Theorems, Active Devices, LR, CR, and LCR circuits.

Part – II (Second Year) Full Marks – 200

Theoretical:

Paper-IV	Full Marks: 100	Group A:	Electromagnetics and Optics.
		Group B:	Solid State Electronics
Paper-V	Full Marks: 50		Active circuits and Instrumentation

Practical :

Paper-VI	Full Marks: 50		Electrical and Electronic Experiments

Part – III (Third Year) Full Marks – 400

Theoretical:

Paper-VII	Full Marks: 100		Communication Electronics, Control Theory and High Frequency Electronic Devices.
Paper-VIII	Full Marks: 100	Group A:	Digital Electronics
		Group B:	Computer (Hardware & Software)

Practical:

Paper – IX	Full Marks: 60		Optical, Electrical and Solid state Physics experiments
Paper – X	Full Marks: 60		Experiments on Digital and Analog

Electronics.

Paper – XI Full Marks: 60 Software Experiments.

Internal Assessments: 20

B.Sc. PART- I ELECTRONICS (HONS.) SYLLABUS

Paper – I (Theoretical Paper) Full Marks: 100

Group - A: Mathematical Methods [45 Lectures]

1. Differential Equation [7 Lectures]

Homogeneous and inhomogeneous (first and second order) – constant and variable coefficient, Frobenious method of power series solution, illustration by Bessel, Special Partial differential equation – Solution by separation of variables (Elementary concepts only), Laplace transformation technique of solving differential equation (no proof is required).

2. Matrix Algebra [5 lectures]

Definitions and rules: Matrix inversion and diagonalisation, Eigen values and Eigen vectors of real symmetric matrix (Elementary concept only), Matrix notation of linear simultaneous equations and solution technique.

3. Complex Variables [8 Lectures]

Complex numbers – polar form, Argand diagram, Functions of complex variables – single and multi valued functions; analytic functions, complex line integrals, Cauchy's integral theorem (no proof is required), Cauchy's integral formula (statement only), Singular points, Poles Essentials singularity, Residue as a pole of order m, Cauchy's residue theorem (statement), Evaluation of simple integrals.

4. Vector Analysis [14 Lectures]

Definitions and notations: Basic operations vector addition, multiplication by scalar, Product of Vectors – Scalar (dot) & Vector (cross), important identities, Cylindrical and Spherical co-ordinates, Vectors Calculus - differentiation and integration of vectors, gradient, Divergence, Curl, Important theorems – Gauss', Stokes, Green's theorems (statement and explanation only).

5. Fourier Series [6 Lectures]

Set of functions – linear independence and completeness, Fourier's theorem (statement only), Analysis of simple waveforms using Fourier series.

6. Special Functions [5 Lectures]

The Gamma function and its characteristics, Evaluation of Gamma function of some arguments, Beta functions, Relation between Gamma and Beta functions.

Group – B: Classical and Quantum Mechanics, Thermal Physics [64 Lectures]

1. Mechanics of Particles [10 Lectures]

Velocity and acceleration – tangential and normal components, radial and cross radial components, time and path integral of force, work, energy, force, potential, conservative and non-conservative forces,

conservation laws, motion under different type forces. Maxwell's laws of velocity distribution, Mean free path, Equipartition theorem.

2. Laws of Thermodynamics [20 Lectures]

First law of thermodynamics – statement and applications, reversible and irreversible processes, isothermal and adiabatic changes, indicator diagram, Carnot's cycle and its efficiency, Second law of thermodynamics, Enthalpy, Joule – Thompson effect, Gibb's paradox, T-S diagrams, regenerative cooling, inversion temperature.

3. Theory of Radiation [12 Lectures]

Spectral emissive and absorptive powers, Kirchhoff's law, Black body radiation, energy density and pressure, Stefan-Boltzmann law, Solar temperature, Wien's law, Rayleigh-Jean's law, Quantum concept of radiation, Planck's law.

4. Thermoelectric Effect [8 Lectures]

Seebeck effect, Peltier effect, Thomson effect, explanation, thermoelectric power, application of thermodynamics to thermoelectric circuits, thermocouple and its uses.

5. Introduction to Quantum Mechanics [14 lectures]

Plank's radiation formula, Photoelectric effect, Compton scattering, Wave nature of particles, de-Broglie hypothesis, phase velocity and group velocity, wave particle duality, concept of wave packet, Davisson-Germer experiment and its significance, Heisenberg's uncertainty principle.

Concepts of wave function of particle, Basic postulates of quantum mechanics, time independent and dependent Schrödinger equation, probability current density, dynamical variables as operator, commutation property of operators, Hermitian operator, Expectation values, discrete energy levels in one-dimensional box with rigid walls, free particle solution, one dimensional step potential, transmission of particles through a potential barrier, degeneracy and degenerate levels, Parity operator.

Paper – II (Theoretical Paper) Full Marks – 50

Circuit Theory and Active Devices [50 Lectures]

1. Transient Analysis of Electrical Circuits with DC Source [6 Lectures]

LR, Circuit – growth and decay of current, CR circuit – charging and discharging, LCR circuit – charging and discharging, Oscillatory discharging, Time constant.

2. Electrical Circuits with AC source [6 Lectures]

Study of LR, CR and LCR circuits with sinusoidal emf source, Power and power factor, Resonant circuit – series and parallel, selectivity and Q-factor, Transformer – construction, equivalent circuit and application.

3. Network Theorems **[8 Lectures]**

Electrical Network, Concepts of branches and trees, Theorems (statement and explanation): superposition, reciprocity, Thevenin's, Norton's and maximum power transfer, symmetrical network, Image impedance, T-π transformation.

4. Analysis of Electrical Circuits **[3 Lectures]**

KCL and KVL, mesh analysis, Nodal analysis.

5. AC Bridges **[7 Lectures]**

Generalized Wheatstone bridge: structure, sensitivity and application; de-Sauty, Maxwell, Schering, Wien and Anderson bridges - analysis and applications.

6. Electro-Statics and Magneto-Statics **[10 Lectures]**

Charge, Coulomb's law, Electric field and potential, charge distribution, Laplace's equation; Electric dipole; Conductors, Capacitors and electrostatic energy, dielectric, polarization.

Magnetic induction, Ampere's Law, magnetic dipole, Magneto static forces, Concept of vector potential.

7. Semiconductor Devices **[10 Lectures]**

Structure and characteristics of p-n junction diode, breakdown in junction diodes, Zener diode, BJT, different modes of operation, JFET, MOSFET, UJT, SCR.

Paper- III (Practical Paper) Full Marks: 50

List of Experiments

1. **Verification of network theorems using resistive networks and D.C. sources:**
   a) Thevenin's theorem,
   b) Superposition theorem.
   c) Maximum power transfer theorem.

2. **Experiments using A.C. source:**
   a) Frequency response characteristics of LR circuits and measurement of inductance,
   b) Frequency response characteristics of CR circuit and measurement of capacitance,
   c) Resonance curves of series LCR circuit and measurement of Q-factor of the circuit,
   d) Resonance curves of parallel LCR circuit and measurement of Q-factor of the circuit.

3. Experiments to study characteristic curves of

a) P-N junction diode,

b) Zener diode,

c) Output characteristics of BJT in CE & CB modes, measurements of current gain and output resistance,

d) Output & transfer characteristics of JEET, measurements of V_p and $V_{GS(off)}$

e) Measurement of hybrid parameters of a BJT using A.C. source.

Text and/ or Reference Books

Paper - I

Mathematical Methods:

Vector analysis, Spiegel - TMH
Higher Engineering Mathematics - B S Grewal, Khanna pub
Advanced Engineering Mathematics, Kreyszig, John Wiley
Vector Analysis-Chakraborty and Ghosh, UN Dhar Pub
Mathematical methods for physicists, Weber and Arfken , Elsevier
Mathematical Physics, Ghatak, Goyal and Chua, Macmillan
Mathematical Methods, M.C. Potter and J. Goldberg, PHI

Classical and Quantum Mechanics:

Introduction to Classical Mechanics, Takwale and Puranik ,TMH
Classical Mechanics, Goldstein, Pearson
Theoretical Mechanics, Spiegel, TMH
Mechanics: Berkeley Physics Course, Vol-1, Berkeley, TMH
Mechanics-R K Shukla and Srivastava, New Age International
Thermal Physics-Zimensky, TMH
A treatise on Heat, Saha & srivastava, The India press
Thermal Physics, A P Gupta & H P Roy, *Books& allied Pub*
Introduction to Mechanics, Klepner, TMH
Quantum Physics, Eisberg and Reisnick, John Wiley
Basic Quantum Mechanics, A. Ghatak, Macmillan India
Quantum mechanics, G. S. Chaddha, New Age
Quantum mechanics, J. Singh, John Wiley & sons

Paper – II (Circuit theory and Active device)

Electricity and Magnetism , A S Mahajan and A . A Rangwala, TMH
Electricity and Magnetism, Rakshit Chattapadhyay, Books & allied Pub
Electricity and Magnetism, B Ghosh, Books& allied Pub
Electricity and Magnetism, D C Tayal, Books& allied Pub

Introduction to Electrodynamics, D.J. Griffiths, PHI
A Text book on electrical Technology Vol-1, BL Theraja & R K Theraja
Network analysis, Van Valkenburg, Pearson
Integrated Electronics, Millman and Halkias , TMH
Foundations of Electronics , Chattopadhyay and Rakshit, New Age
Electronic Devices and Circuit Theory, R. L. Boylestad and L. Nashelsky, Pearson
Basic Electronics & Linear Circuits, Bhargava, Kulashretha Gupta, TMH
Solid State electronic devices-Streetman & Banerjee, PHI

Paper – III (Practical Reference Books)

Basic Electronics: A Text Lab Manual, Zbar, TMH
Laboratory Manual for Electronic Devices and Circuits, Bell, PHI
Laboratory Manual for Electric Circuits , Bell, PHI
Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH.
Practical Physics , Rakshit and Chattopadhyay
Advanced Practical Physics Volume II B. Ghosh, New Central Book Agency.

B.Sc. PART- II ELECTRONICS (HONS.) SYLLABUS

Paper - IV (Theoretical Paper) Full Marks: 100

Group – A: Electromagnetics and Optics [50 Lectures]

1. Electromagnetic Induction [4 Lectures]

Faraday's laws, motional emf, self inductance, mutual inductance.

2. Maxwell's Equations [12 Lectures]

Displacement current, Maxwell's equations in differential and integral forms , Poynting vector, Plane electromagnetic waves, wave equations in isotropic dielectrics and in conducting media, attenuation constants , reflection and refraction of plane wave at the boundary of two dielectrics, reflection and transmission coefficients, polarization, Brewster's law.

3. Wave Optics [20 Lectures]

Interference: Spatial and temporal coherence, intensity distribution; Fresnel biprism. **Diffraction**: Fresnel and Fraunhofer class, Fresnel's half period zone, zone plate. Single slit, double slit, grating.

Polarization: Different states, double refraction, uniaxial crystal, Nicol prism, Polaroid, Production and analysis of different kinds of polarized light, Polarimeter.

4. Laser and Fiber Optics [14 lectures]

Coherent light sources, spatial and temporal coherence of light, spontaneous emission, stimulated emission and absorption, Einstein's A and B coefficients and the derivation of their mutual relation, Population inversion, concept of MASER, Classification of laser, He-Ne laser, Semiconductor junction laser.

Optical fiber and its application in long haul communication, Types of optical fiber, Numerical aperture and aperture angle of optical fiber, Meridional and skew rays in optical fiber, Multipath broadening in optical fiber.

Group-B: Solid State Electronics [50 Lectures]

1. **Crystal Physics** **[12 Lecture**

   Crystal bonding – ionic, covalent, metallic and Vander wall bond, Unit cell, Bravais Lattice, symmetries – rotation, reflection, inversion, Diffraction of X-Rays by crystal lattice, Bragg's law, Miller indices, Reciprocal lattice.

2. **Classical Free Electron Theory** **[10 Lectures]**

   Electrical properties of matter – relaxation time and mean free path, Fermi energy and Fermi surface parameters, electrical conductivity, Wiedemann-Franz law; Thermionic emission, Richardson - Dushman equation (derivation not required).

3. **Band Theory of Solids** **[12 Lectures]**

   Qualitative discussion of Bloch function, Kronig -Penney model, E-K diagram, Reduced zone representation, Brillouin zone, Effective mass, concept of hole, classification of solids - metal, insulator and semiconductor.

4. **Semiconductor Physics** **[12 Lectures]**

   Energy band theory of solids, semiconductors – intrinsic and extrinsic, Donor and acceptor impurities, degenerate and nondegenerate, direct and indirect band gap, elemental and compound semiconductors, current conduction by drift and diffusion processes, Einstein's equation; Ionization energy of impure semiconductor; Fermi level calculation of semiconductors, Mobility and Hall effect; Matthiessen's rule; Photo conduction in semiconductors; Thermionic emission from semiconductors.

5. **Superconductor** **[4 Lectures]**

   Superconductivity, Electrical and magnetic properties of superconductors, Superconducting materials, types of superconductors, applications of superconductors.

Paper - V (Theoretical Paper) Full Marks: 50

Active circuits and Instrumentation [80 Lectures]

1. Diode Circuits [08 Lectures]

Rectifier circuits - half wave, full wave and bridge rectifier, Capacitor filter, Inductor input filter, Pi-section filter, Regulated power supply, Clipper and Clamper circuits.

2. Transistor Circuits [08 Lectures]

Operating point, Load line (DC & AC), Transistor biasing, Stability, h-parameter model.

3. Amplifier Circuits [15 Lectures]

RC coupled amplifier, Tuned amplifier - single tuned, double tuned (qualitative), Feed back in amplifier, Classification of power amplifiers, Class A - direct coupled, and transformer coupled, Class-B – push pull, Harmonic distortion, Complementary symmetry.

4. Operational Amplifier [08 Lectures]

Differential amplifier, CMRR, OP AMP characteristics, Applications of OP AMP as Inverting & Non – inverting amplifier, Adder, Subtractor, Voltage follower, Differentiator, Integrator, Logarithmic & Exponential amplifiers.

5. Oscillator Circuits [08 Lectures]

Condition of oscillation, Tuned oscillators, RC oscillators, Crystal oscillator, Astable Multivibrator.

6. Modulation and Demodulations: Theory and Systems [12 Lectures]

Modulation technique, Classification - AM, FM, PM, Modulation index of AM, Frequency spectrum - AM modulator, side bands and bandwidth, FM modulator - Frequency spectrum of FM and its bandwidth, Modulation index, Conversion of FM to PM and vice versa, AM demodulators linear and square law, FM demodulator – limiter, discriminator, ratio detector, Comparison between AM and FM, Concept of phase locked loop (PLL).

7. Basic Measuring Instruments [08 Lectures]

Multimeters – analog and digital, Cathode Ray Oscilloscope.

8. Sensors and Transducers [05 Lectures]

Classification of transducers/sensors - Mechanical, Thermal, Chemical, Acoustic, Electromagnetic, Electrical, Solid state transducers (principles only).

9. Power Electronics [08 Lectures]

Single phase and multiphase rectifiers, Inverter circuits, Controlled and special purpose rectifiers.

Paper- VI (Practical Paper) Full Marks: 50

Electrical and Electronic Experiments

List of Experiments

1. Studies of rectifier circuits with and without filters.
2. Voltage regulator circuits using Zener diode and IC chip.
3. To study the frequency characteristics of:
   a) C.E. transistor amplifier;
   b) R.C. Coupled amplifier.
4. Experiments using Op-amp:
   a) Inverting and non- inverting amplifier;
   b) Adder;
   c) Integrator and differentiator;
   d) Astable Multivibrator.
5. Measurement of frequency and relative phase of electrical signals using CRO.
6. Measurements of:
   a) Low resistance by Kelvin Double bridge;
   b) Self inductance by Anderson Bridge;
   c) Temperature using thermocouple and the thermoelectric power of the thermocouple.

Text and/ or Reference Books

Paper - IV

Electromagnetics and Optics:

Electricity and Magnetism, Rakshit & Chattapadhyay, Books& allied Pub
Electricity and Magnetism, B Ghosh, Books& allied Pub
Electricity and Magnetism, D C Tayal, Books& allied Pub
Introduction to Electrodynamics, D.J. Griffiths, PHI
Optical Electronics , Ghatak, Cambridge
Optics, Ghatak, TMH
Optoelectronics, Wilson and Hawkes, PHI.
Wave Optics, B Ghosh

Solid State Electronics:

Introduction to Solid State Physics, C.Kittel, John Wiley

Solid State Electronic Device, Streetman , Pearson
Solid State Physics, Singhal, Kedarnath, Ramnath publications
Semiconductor Physics and Devices, Neaman,
Solid state physics & Electronics, AB Gupta& N. Islam, *Books& allied Pub*
Semiconductor Physics, R K Puri &Babbar

Paper - V

Integrated Electronics, Millman and Halkias, TMH
Electronic Principles, Malvino, TMH
Electronic Devices and Circuit theory, Robert L. Boylestad & Louis Nashelsky*,* PHI
Electronic Circuits, Schilling and Belove, TMH
Electronic Devices and Circuits, Salivahanan , TMH
OP-Amp and Linear Integrated circuits, Gaykwad, Pearson
Foundations of Electronics , Chattopadhyay and Rakshit New Age International
Modern Electronic Instrumentation and Measurement Techs, Helfrik & Cooper, Pearson
Elements of Electronic Instrumentation and Measurement, Carr, Pearson
Electronic Instrumentation, Kalsi, TMH
Electronic Instrumentation and Measurement, Zbar, McGraw Hill

Paper – VI (Practical Reference Books)

Basic Electronics: A Text Lab Manual, Zbar, TMH
Laboratory Manual for Electronic Devices and Circuits, Bell, PHI
3. Laboratory Manual for Electric Circuits , Bell, PHI
4. Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH.
5. Practical Physics , Rakshit and Chattopadhyay
6. Advanced Practical Physics Volume II B. Ghosh, New Central Book Agency.
7. *Laboratory Manual for Op-amp and Linear ICs*, Bell, PHI.

B.Sc. PART- III ELECTRONICS (HONS.) SYLLABUS

Paper- VII (Theoretical Paper) **Full Marks: 100**

Communication Electronics, Control Theory and High Frequency Electronic Devices:

[100 Lectures]

1.Elements of Signal and Noise Analysis [15 Lectures]

Time domain and frequency domain, representation of signals. Fourier Transforms of some useful functions (Exponential pulse, Gaussian pulse, Triangular pulse), Convolution sampling Theorem (Statement only), Thermal noise, Shot noise, Partition noise, Probability density functions of different kinds of noise, Equivalent noise resistance, Signal to noise power ratio concept, Noise temperature and noise figures.

2. Transmission Line and Wave Guide [10 Lectures]

Distributed circuit parameters; transmission line theory, secondary line constants, line loss, Standing wave, Standing wave ratio, Rectangular wave guide - TE and TM modes.

3.Radiation of Electromagnetic Waves [10 Lectures]

Oscillating electric dipole; Power radiated by current element, Short antenna, quarter wave monopole, half wave dipole, Antenna arrays (elementary ideas).

4. Propagation of Radio Waves [5 Lectures]

Modes of Propagation (Ground wave, Space wave, Sky wave/lonospheric, Satellite Propagation), Reflection from ionosphere, Skip distance, MUF, Multihop transmission (qualitative discussions only).

5. Audio Broadcasting Systems [10 Lectures]

AM and FM broadcasting systems - transmitter, receiver and propagation consideration,

6. Television system [10 Lectures]

TV standards, Concepts of scanning, Video bandwidth calculation, TV camera and picture tube, Transmitter and receiver, Concepts of colour TV, Features of cable TV.

7. RADAR System [10 Lectures]

Basic system, Range equation, Transmitter and Receiver, CW RADAR, Application of RADAR. Satellite communication (idea only), Up-linking and down-linking.

8. Elements of Digital Modulation Technique [10 Lectures]

Baseband digital modulation, Pulse amplitude modulation, pulse time modulation, PCM, DM, ADM, Error probability, Signaling rate, Pass band digital modulation – ASK, FSK, PSK, QPSK, Radiotelegraph transmitter.

9. Control Theory [10 Lectures]

Principles of control system – open loop and closed loop control system, Error detection sub system, Error correcting means, Performance specification – bandwidth, phase margin sensitivity, static error, System stability, PI & PID control systems.

10. High frequency electronic devices [10 Lectures]

Microwave and Optoelectronic Devices: Klystron, Magnetron, Tunnel Diode, Gunn Diode, IMPATT diode, TRAPATT, LED, Photo diode, Solar cell, Laser diode.

Paper- VIII (Theoretical Paper) Full Marks: 100

Group – A: Digital Electronics [50 Lectures]

1. Number System and Codes [10 Lectures]

Positional number systems: Binary, Octal, Decimal, Hexadecimal number systems, Integer representation schemes, signed magnitude, 1's complement, 2's complement, Real number representation, Codes – BCD, ASCII and EBCDIC, Error detection and error correcting codes.

2. Boolean Algebra [6 Lectures]

Logic operations, Theorems of Boolean algebra, Boolean expressions and their simplification, Karnaugh Map technique: Simplifications of expressions for more than four variables, SOP and POS representations.

3. Digital Logic Families [8 Lectures]

Logic gates, Digital logic families, RTL, DTL, TTL, ECL, MOS logic, Tristate logic.

4. Combinational Circuits [10 Lectures]

Characteristics of combinational circuit, Adders and Subtractors, Digital comparators, Parity checkers generators, Multiplexers, Demultiplexures, PLAs, Boolean expressions using multiplexers.

5. Sequential Logic Circuit [10 Lectures]

Flip-flops – RS, JK, JK Master slave, D and T types, Registers – universal shift registers, Counters - asynchronous and synchronous.

6. Timing Circuits [6 Lectures]

Timers – 555, IC, Multivibrators – astable, monoshot, Waveform generators.

Group- B: Computer Hardware and Software [50 Lectures]

1. Basics of Computer Organization [08 Lectures]

Functional introduction to Hardware structure of a Computer, CPU, memory, I/O devices, uniprocessor and multiprocessor systems, Personal computer and computer network, Multimedia (elementary idea of each topic).

2. Elements of Microprocessors [10 Lectures]

Microprocessors as single chip CPUs, ALU, Structure of 8085 up, Addressing modes, Instruction set, Assembly language program. 8085 family (introduction only).

3. Memory Circuits [08 Lectures]

Classification of memory circuits, Semiconductor memory, magnetic memory, Optical memory, ROM, PROM, EPROM, RAM static and dynamic (physical explanation only), CCD memory (principle of operation only).

4. Elements of Computer Software [07 Lectures]

System software, High level language, Translators, Editors, Operating system – DOS and Windows.

5. High Level Programming Language [07 Lectures]

Program structure, Programming with C Language.

6. Programming of the Problems of Numerical Analysis [10 Lectures]

Solution of mathematical problems using computer – Algebraic equations, System of linear equations, Differential equations, Numerical integration.

Paper – IX (Practical) **Full Marks – 60**

Optical, Electrical and Solid State Physics Experiments

1. Experiment on interference phenomenon: Fresnel's biprism or Lloyd's mirror.
2. Experiment on Diffraction phenomenon: Single slit and Plane transmission grating.
3. Experiment on Polarization phenomenon.
4. Experiment to find the band gap of a semiconductor.
5. Experiment to measure the resistivity of a given sample (four probe method)
6. Experiment on Hall Effect.

Paper –X (Practical) **Full Marks – 60**

Analog and Digital Electronics Experiments

1. Verification of De Morgan's theorems using basic gates.
2. Construction and Verification of Combinational logic circuits: half Adder, Full Adder, Encoder-Decoder, Mux, Demux.
3. Construction and Verification of sequential logic circuits: Flip-flops, Registers, Counters.
4. Experiment on timer circuits.
5. Experiment to study the performance of ADC and DAC circuits.
6. Experiment to study analog demodulation techniques: AM detectors, FM detectors.
7. Experiment to study basic digital modulation techniques.
8. Experiment to study the properties of SCR and UJTs.

Paper – XI (Practical) Full Marks – 60

Software Experiments

In the final examination, a group of software experiments has to be performed. The course of this paper includes assembly language programming of 8085 microprocessor and high level language programming using C.

(i) *Assembly Language Programming on the 8085-Microprocessor*

Sample problems*: *For the following problems, draw the flow chart and write the Assembly Language Program for 8085 microprocessor and execute them

(a) Count number of 1's and 0's in an eight bit number
(b)Addition of two numbers with carry
(c) Multiplication of two numbers
(d) Maximum and Minimum of a given Array
(e) Transfer the memory block
(f) Reverse the memory block
(g) To test whether an integer number is even or odd.
(h) Lowest common factor of a given Array
(i) Highest common factor of a given Array
(j) Generate first N terms of the Fibonacci series
(k) Sort a given Array
(l) Addition of two BCD numbers
(m) Conversion of BCD to Binary number
(n) Palindrome test of a eight bit number

(ii) Computer programming in C-language

Sample problems: Write program using C language and execute them

(a) Find roots of a quadratic equation.
(b) Count the negative, zero and positive numbers among N real numbers
(c) To test whether a given integer is perfect square or not.
(d) To determine the sum of 10 numbers using for-loop
(e) To test whether a given integer is palindrome or not.
(f) To find the maximum and the minimum among N numbers.
(g) To test whether an integer is even or odd.
(h) To generate first N terms of the Fibonacci sequence
(i) To find GCM and LCM of two given integers.
(j) To find sum of the series:

$1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+.....+\frac{x^n}{n!}$ for given x and n.

Internal Assessment: 20

Text and/ or Reference Books

Paper – VII

Communication Electronics, Control Theory, High frequency Devices:

Electronic Communication Systems, Kennedy, TMH
Communication systems, Singh and Sapre, TMH
Communication systems, Haykin, John Wiley
Communication systems, Lathi, Oxford
Electronic communication Systems, Roddy and Coolen, Pearson
Microwave Devices and Circuits, Liao, Pearson
Microwave, Sisodia and Gupta, New Age
Microwave Engineering, Das, TMH
Power Electronics, Bimbhra, Khanna Pub.
Control system Engineering- Nagrath and Gopal, New age international
Automatic control systems (with matlab program) Hasan Saeed, S K kataria & sons
Linear control system (with matlab program), Manke, Khanna pub
Problem & Solutions of control system-Jairath, CBS pub& distributers
Control Systems, K R Var,aj. Tata Mcgraw Hill
Modern Control Engineering, K. Ogata, PHI

Paper - VIII

Digital Electronics:

Digital Logic and Computer Design, Mano , Pearson
Digital computer electronics, Malvino and Brown, Tata McGraw Hill
Digital Principles, Leach and Malvino , TMH
Modern Digital Electronics, Jain, TMH
Digital Circuits, Vol-I and II, D.RoyChaudhuri, Platinum publishers
A text book of digital electronics, Sedha, S. Chand

Computer (Hardware, Software):

Microprocessor achitecture with the 8085, R.S.Gaonkar, Penram International
Microprocessors,Interfacing and applications , Renu Singh and B.P.Singh, New Age
Microprocessor, Suni Mathur, PHI
Microprocessor, Uday Sankar , Pearson
Progress in ANSI C, Balaguruswamy, TMH
Computer concepts and C programming, Gupta, Wiley India
Mastering C, Benugopal and Prasad, TMH

Paper – IX, X & XI (Practical Reference Books)

Practical Physics, Rakshit and Chattopadhyay
Advanced Practical Physics. Volume II, B. Ghosh, New Central Book Agency.
Digital Circuits, Volume-I and II, D.Roy Chaudhuri, Platinum publishers
Laboratory Manual for Electronic Devices and Circuits, Bell, PHI
Laboratory Manual for Electric Circuits, Bell, PHI
Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH..
Laboratory Manual for Op-amp and Linear ICs, Bell, PHI.
Microprocessor achitecture with the 8085, R.S.Gaonkar, Penram International
Microprocessors,Interfacing and applications , Renu Singh and B.P.Singh, New Age
Microprocessor, Suni Mathur, PHI
Microprocessor, Uday Sankar , Pearson
Progress in ANSI C, Balaguruswamy, TMH
Computer concepts and C programming, Gupta, Wiley India
Mastering C, Benugopal and Prasad, TMH