## BHARATHIAR UNIVERSITY, COIMBATORE

**B.Sc. Electronics with compulsory Diploma in Computer Technology**

**Scheme of Examination (CBCS PATTERN)**

For candidates admitted during the Academic Year 2008-2009 and onwards

<table>
<thead>
<tr>
<th>SEM</th>
<th>Part</th>
<th>Subject and Paper</th>
<th>Instruction Hrs./Week</th>
<th>Exam</th>
<th>Credit</th>
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### III
- **Paper VI**: IC’s and Instrumentation
- **Paper VII**: Bio Medical Instrumentation
- **Paper VIII**: Television Engineering
- **Pract. III**: Electronic Circuits & Communication Lab
- **Pract. IV**: Digital & Medical Electronics Lab
- **Allied**: IV Object Oriented Programming using C++
- **Pract. V**: Computer Programming Lab

### IV
- **Skill based Subject 2 (Diploma)**:
  - Visual Programming
  - Tamil @ /Advanced Tamil # (OR)
  - Non-major elective -II (General Awareness #)

<table>
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<th>Paper</th>
<th>Subject</th>
<th>Credits</th>
<th>Practice Credits</th>
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<td>X</td>
<td>Industrial Electronics</td>
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### V
- **Paper IX**: 8085 Microprocessor
- **Paper X**: Industrial Electronics
- **Pract. VI**: IC, TV and Industrial Electronics Lab
- **Pract. VII**: Microprocessors and Interfacing Lab
- **Pract. VIII**: Microcontroller Lab
- **Elective – I**
- **Skill based subject – 3 (Diploma)**
- **Elective – II**
- **Elective – III**
- **Elective – IV**
- **Skill based subject – 4 (Diploma)**
- **Practical Visual and Java Programming**
- **Extension Activities @**

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**Total**: 3600 140

@ No University Examinations. Only Continuous Internal Assessment (CIA)

# No Continuous Internal Assessment (CIA). Only University Examinations.

### List of Elective papers (Colleges can choose any one of the paper as electives)

<table>
<thead>
<tr>
<th>Elective – I</th>
<th>A</th>
<th>Home Appliances &amp; its Servicing *</th>
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<th>A</th>
<th>8085 Microprocessor interfacing &amp; its Applications</th>
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<td>B</td>
<td>Microwave and Fiber Optic Communications</td>
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<td>C</td>
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<td>B</td>
<td>Design with PIC Microcontroller</td>
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<tr>
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<td>C</td>
<td>Computer Hardware and Maintenance</td>
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* - yet to be submitted
BASIC ELECTRONICS

UNIT I RESISTORS & INDUCTORS
Types of resistors: Fixed, Variable. Brief mention of their construction and characteristics -Color coding of resistors-Connecting resistors in series and parallel.

UNIT II CAPACITORS

UNIT III ELECTRICAL ELEMENTS AND CIRCUITS

UNIT IV NETWORK THEOREMS
Superposition theorem-Thevenin Theorem-Thevenizing a circuit with two voltage sources-Thevenizing a bridge circuit-Norton’s Theorem-Thevenin Norton conversion-Conversion of voltage and current sources-Millman’s Theorem-Star and Delta conversion-Maximum power transfer theorem-Simple problems in DC circuits.

UNIT V AC CIRCUITS

TEXT BOOK:
SEMICONDUCTOR DEVICES

UNIT I PN JUNCTION DIODE

UNIT II SPECIAL DIODES
Zener diode - VI Characteristics – Breakdown - Backward diode - Varactor diode - Step recovery diode - Point contact diode - Scott key diode - Tunnel diode - Gunn diode - Impaat diode - PIN diode - PNPN diode.

UNIT III BJT

UNIT IV FET AND UJT
Introduction to FET - Construction and operation of N-channel JFET - Drain characteristics - Comparison of JFET & BJT - Introduction to MOSFET - Enhancement MOSFET – Depletion MOSFET - FET as a voltage variable Resistor(VVR) - Introduction to UJT – Characteristics – UJT as relaxation oscillator - Introduction to PUT – SCR – TRIAC - DIAC

UNIT V OPTOELECTRIC DEVICES

TEXT BOOK:
2. S. L. Kakani, K. C. Bhan Dai “A TEXT BOOK OF ELECTRONICS”.
SEM – I & II

BASIC ELECTRONICS LAB
(Any 16 Experiments)

1. Study of Multimeter – Checking of components.
2. Measurement of Amplitude, Frequency & Phase difference using CRO.
3. Verification of Ohm’s Law.
5. Resistance in series, parallel and series – Parallel.
6. Voltage and Current dividers
7. Verification of Kirchoff’s Law.
8. Wheatstone Bridge.
9. Verification of Norton’s theorem.
10. Verification of Thevenin’s Theorem.
11. Verification of Millman’s Theorem.
12. Verification of Superposition Theorem.
13. LCR Bridge.
15. Parallel resonance circuit.
17. Transient response of RL Circuit.
22. Verification of Maximum power transfer Theorem
23. Measurement of resistance and capacitance in series and parallel
SEM – I & II

SEMICONDUCTOR DEVICES LAB
(Any 16 Experiments)

1. Band Gap energy of Silicon / Germanium Diode.
4. Transistor Characteristics of CE Configuration.
5. Transistor Characteristics of CB Configuration.
6. Transistor Characteristics of CC Configuration.
7. Clipping Circuits.
8. Clamping Circuits.
11. V-I Characteristics of JFET.
12. V-I Characteristics of UJT.
13. UJT as Oscillator.
14. FET as Voltage Variable Resistor (VVR).
15. Characteristics of LDR.
17. Study of IR (Tx & Rx).
18. Study of LED and 7 Segment display.
20. Zener as a Voltage regulator.
21. ON / OFF control of relay using Opto – Couplers.
22. Characteristics of SCR
23. TRIAC Characteristics
SEM – III

Core Paper – III

ELECTRONIC CIRCUITS

UNIT I  REGULATORS

UNIT II  SMALL SIGNAL AMPLIFIERS

UNIT III  POWER AMPLIFIERS
Operation and graphical representation of Class A, Class B, Class C and Class AB amplifiers – Maximum collector efficiency of class A power amplifier – Collector dissipation curve – Harmonic distortion – Class B push pull amplifier – Crossover distortion – Complementary symmetry push pull amplifier

UNIT IV  FEEDBACK AMPLIFIERS
Basic concepts of feedback – Positive feedback – Negative feedback – Effects of negative feedback on gain, bandwidth and distortion – Noise – Voltage series feedback - Voltage shunt feedback – Current series feedback – Current shunt feedback

UNIT V  OSCILLATORS AND MULTIVIBRATORS

TEXT BOOK
2 B.L.Theraja, “BASIC ELECTRONICS”, S.Chand Company Ltd.2000
DIGITAL PRINCIPLES AND APPLICATIONS

UNIT I  NUMBER SYSTEM AND CODES

UNIT II  BOOLEAN ALGEBRA AND LOGIC GATES

UNIT III  COMBINATIONAL LOGIC CIRCUITS

UNIT IV  SEQUENTIAL LOGIC CIRCUITS

UNIT V  D/A AND A/D CONVERTERS
Digital to Analog converters: Resistive divider type and Ladder type – Accuracy and Resolution. Analog to Digital converters: Counter – Ramp type – simultaneous conversion – Dual slopetype – Successive approximation type – Accuracy and resolution.

TEXT BOOKS
SEM – III Core Paper – V

PRINCIPLES OF COMMUNICATION SYSTEMS

UNIT I MODULATION TECHNIQUES

UNIT II TRANSMITTERS

UNIT III RECEIVERS
Super heterodyne principle – Image rejection – Choice of IF and oscillator frequencies – Tracking – Block diagram of AM receiver – FM receiver – SSB receiver

UNIT IV ANTENNA

UNIT V PROPAGATION OF RADIO WAVE
Reflection and refraction of radio waves: Reflection of radio waves at the surface of the earth – Ground or surface wave propagation – Space wave propagation – Sky wave propagation – Structure of Ionospheric Layer – Skip distance – Maximum Usable Frequency (MUF)

TEXT BOOKS
UNIT 1  MODERN COMPUTER ORGANIZATION
Introduction – Layers in modern computer – Computer organization – Main
Memory – CPU Operation – Computer types – System performance and measurement –
High performance techniques – Booting sequence – Computer design process –
Computer structure – Computer Function – Architecture and Organization – CISC Vs RISC

UNIT 2  PROCESSOR DESIGN AND DATA PATH
Introduction – Processor role – Processor design goals – Processor design process –
Data path organization – Main memory interface – Local storage register file – Data path simple instructions

UNIT 3  MEMORY DESIGN AND MANAGEMENT
Introduction – Memory parameters – Classification of memory – Memory Technology – Main memory allocation – Static RAM IC – Dynamic RAM – ROM logic – Multiple memory decoding – Memory Hierarchy – Main memory drawbacks – Cache memory – Principle of cache – Virtual memory Concept – Advantage of Virtual memory

UNIT 4  COMPUTER PERIPHERALS

UNIT 5  ADVANCED SYSTEM ARCHITECTURE

TEXT BOOK
SEM – IV  
Core Paper – VI

IC’S AND INSTRUMENTATIONS

UNIT I  IC FABRICATION TECHNOLOGY

UNIT II  TIMER AND PLL

UNIT III  OPERATIONAL AMPLIFIER

UNIT IV  TRANSDUCERS

UNIT V  ELECTRONIC INSTRUMENTS

TEXT BOOKS
SEM – IV Core Paper – VII

BIO-MEDICAL INSTRUMENTATION

UNIT I

UNIT II

UNIT III

UNIT IV
Pacemakers – energy requirements to excite heart muscle – methods of stimulation – different modes of operation – pacemaker batteries – artificial heart valves – different natural heart valves – different types of artificial heart valves – defibrillators – different types of defibrillators – heart lung machine

UNIT V

TEXT BOOKS
UNIT I  TELEVISION STANDARDS

UNIT II  TELEVISION RECEIVER SECTION

UNIT III  SYNC SEPARATOR

UNIT IV  COLOUR TELEVISION
Block diagram of color TV Receiver.

UNIT V  ADVANCE TECHNIQUES

TEXT BOOKS
SEM – III & IV

Core Practical – III

ELECTRONIC CIRCUITS & ELECTRONIC COMMUNICATION LAB
(Any 16 Experiments)

ELECTRONIC CIRCUITS
1. DC regulated power supply using Zener diode
2. Voltage doubler
3. Feedback amplifier
4. Emitter follower
5. Transformer coupled amplifier
6. Hartley Oscillator
7. Colpitts oscillator
8. Phase shift Oscillator
9. Wein Bridge oscillator
10. RC coupled amplifier
11. Half wave and full wave rectifier
12. Filter circuits

ELECTRONIC COMMUNICATION
13. Performance of IF Amplifier
14. AM Modulation and Detection
15. FM Modulation and Detection
16. PAM modulation
17. PIN diode oscillator
18. Alignment of dish antenna
19. Alignment of satellite receiver
20. PWM modulation
21. PPM modulation
22. PCM modulation
23. GUNN diode oscillator
SEM – III & IV
Core Practical – IV
DIGITAL & MEDICAL ELECTRONICS LAB
(Any 16 Experiments)

DIGITAL ELECTRONICS
1. Verification of basic gates and universal gates
2. Verification of Demorgan’s Theorem
3. Half adder and full adder
4. Half subtractor and full subtractor
5. 4-bit binary adder
6. Multiplexer and De multiplexers
7. Encoder and Decoder
8. BCD to 7-segment Display
9. Study of Flip Flops
10. Binary to Grey and Grey to Binary conversion
11. Shift registers and ring counter
12. Analog to Digital converter
13. Digital to Analog converter
14. Design and Simulation of Logic Gate using VHDL Coding
15. Design and Simulation of Adder Circuits using VHDL Coding
16. Design and Simulation of Encoder and Decoder using VHDL Coding
17. Parity checker and generator
18. 4 bit binary counter
19. Decade counter
20. BCD counter/ adder

MEDICAL ELECTRONICS
21. Pulse Rate Monitor.
22. Temperature monitor using AD 590
23. ECG Measurement
24. Notch filter
25. Pacemaker
SEM – IV
Diploma Paper – II

VISUAL PROGRAMMING

UNIT I

UNIT II

UNIT III

UNIT IV
Database Connectivity – Min Database Applications – Embedding Controls in View creating user defined DLL’s – Dialog Based Applications – Dynamic Data Transfer Function – Data Base Management with ODBC – Communicating with other applications – Object Linking and Embedding.

UNIT V

TEXT BOOKS

REFERENCES
SEM – V                               Core Paper – IX

8085 MICROPROCESSOR

UNIT I  MICROPROCESSOR ARCHITECTURE

Microprocessor architecture and its operation – Memory map of 1k memory chip – memory and instruction fetch – 8085 microprocessing unit – Bus timings – Demultiplexing the buses AD 7 – AD0 – Generating control singles – Functional Block diagram of 8085.

UNIT II  TIMINGS AND INSTRUCTION SET


UNIT III  PROGRAMMING THE 8085

Data transfer operations – arithmetic operations – Logical operations – Branch operations – Looping, counting and indexing – addition, subtraction of 8 and 16 bit numbers.

UNIT IV  TIME DELAY

Time delay using a single register – Time delay using a register pair – Counter design of Time delay program. Function of PUSH, POP, CALL and RET instructions.

UNIT V  MEMORIES


TEXT BOOKS
INDUSTRIAL ELECTRONICS

UNIT I THYRISTORS AND THEIR OPERATIONS


UNIT II TURN ON/OFF MECHANISM


UNIT III APPLICATION OF SCR


UNIT IV INVERTORS

Types of invertors – Single phase bridge inverter – Mc Murray impulse communication inverter – Single phase half bridge voltage source inverter – Single phase full bridge voltage inverter – Step down choppers – Step up choppers – Chopper classification

UNIT V APPLICATIONS


TEXT BOOKS:

SEM – V
Diploma Paper – III

INTERNET & JAVA PROGRAMMING

UNIT I

Internet – Introduction- Understanding Internet- Internet Addressing - Hardware Requirements to Connect to the Internet

UNIT II

Data types, Arrays, Operators, Flow control – Branching, Looping

UNIT III

Classes – New Operator, Dot Operator, Method Declaration and Calling, Constructors, This In Constructors, Inheritance, Super, Method Overriding Final, Finalize, Static, Package and Import Statement, Interface and Implements

UNIT IV

Exception Handling – Exception Types, Uncaught and Calling, Nested Try Statements, Java Thread Model, and Thread, Runnable, Thread Priorities, Synchronization, Deadlock

UNIT V


TEXT BOOKS

UNIT I

Microprocessor and Microcontroller – 8051 Microcontroller hardware:
8051 oscillator and clock – Program counter and data pointer – A & B CPU register –
Flags & PSW – Internal memory – Internal RAM – Stack and stack pointer – Special
function registers – Internal ROM – Input/Output pin, ports and circuits – External
memory

UNIT II PERIPHERAL

Counter & Timer: Timer/Counter interrupts – Timing – Timer modes of
operation – Counting – Serial data input/output: Serial data interrupt – Data transmission
– Data reception – Serial data transmission modes

Interrupts: Timer flag interrupt – Serial port interrupt – External interrupt – Reset
– Interrupt control – Interrupt priority – Interrupt destination – Software generated
interrupts

UNIT III ARITHMETIC AND LOGICAL OPERATIONS

Introduction – Addressing modes – Byte level logical operations – Bit
level logical operations – Rotate and swap operations – Simple program

Addition – Subtraction – Multiplication and Division – Simple programs

UNIT IV INSTRUCTION SET

Introduction – External data move – Code memory read only data move –
Push & pop – Opcodes – Data exchanges – Simple programs

Jump and call instruction: Introduction – Jump and call program range – Jumps –
Calls and subroutine – Interrupt and returns – More detail on interrupts – Simple
programs

UNIT V APPLICATIONS

Keyboard interfacing – Display interface – 7 Segment and LCD display –
D/A conversion – A/D conversion – Stepper motor interface

TEXT BOOKS:

1. Kenneth J. Ayala, “The 8051 Microcontroller architecture, programming and
   application” 2nd Edition, Penram International
   and Embedded System”, Pearson Publishers
IC, TV AND INDUSTRIAL ELECTRONICS LAB
(ANY 16 EXPERIMENTS)

IC LAB
1. Astable multivibrator using 555
2. Monostable multivibrator using 555
3. Inverting and Non Inverting amplifier
4. Adder and Subtractor using IC 741
5. Instrumentation Amplifier
6. Voltage to Current Converter and Current to Voltage
7. Wein Bridge oscillator using IC 741
8. Square wave and Triangular generator
9. Schmitt Trigger using IC 741

TV LAB
10. Video IF section of TV Receiver
11. EHT Generation
12. Sync Separator
13. Horizontal Section faults
14. Vertical Section faults
15. Tuner Section faults
16. Video Section faults
17. Picture tube basing faults
18. Video IF section faults

INDUSTRIAL ELECTRONICS LAB
19. Automatic Street light
20. Single Phase Inverter
21. DC Choppers (Step up and Step down)
22. R and RC Triggering
23. External Pulse Commutation
24. DC motor controller and Light Dimmer
25. Time delay circuit
MICRO PROCESSOR AND INTERFACING LAB
(ANY 16 EXPERIMENTS)

8085 MICROPROCESSOR LAB
1. Addition / subtraction of 8 / 16 bit data.
2. Multiplication / division 8 bit data.
3. Block data transfer.
4. Smallest / largest of N numbers.
5. To arrange in ascending / descending order.
6. Sum of N 8 bit numbers.
7. 1’s and 2’s compliment of an array (8 / 16 bit).
8. UP/DOWN counter using 7 segment displays.
10. Data transfer using 8255 (PPI).
11. Square wave generator using 8255.
12. ADC interface.
13. DAC interface.
15. Solid State Relay Interface
16. Time Delay Programme
17. Digital Clock
18. Rolling and Blinking of a message
19. LCD interface
20. Frequency Counter
21. Water level Indicator
22. DC motor interface
23. Temperature controller
8051 MICROCONTROLLER LAB
(ANY 16 EXPERIMENTS)

1. Addition / subtraction of 8 / 16 bit data.
2. Multiplication / division 8 bit data.
3. Block data transfer.
4. Smallest / largest of N numbers.
5. To arrange in ascending / descending order.
6. Sum of N 8 bit numbers.
7. 1’s and 2’s compliment of an array (8 / 16 bit).
8. UP/DOWN counter using 7 segment displays.
10. Wave form generation.
11. ADC interface.
12. DAC interface.
14. Solid State Relay Interface
15. Time Delay Programme
16. Digital Clock
17. Rolling and Blinking of a message
18. LCD interface
19. Frequency Counter
20. Water level Indicator
21. DC motor interface
22. Temperature controller
VISUAL AND JAVA PROGRAMMING LAB

VISUAL PROGRAMMING (ANY 8 EXPERIMENTS)

2. Working with Intrinsic Control and Active X controls.
3. Create an Application with multiple forms and dialogs.
4. Write a VB program to design an e-mail registration form.
5. Create an Application with Menu editor.
6. Create an Application with DAO controls.
7. Create an Application using Common dialogs.
8. Write a program for Drag and Drop Events.
9. Create a Database for library management using ADD controls.
10. Creating an application using Active X control.
11. Create a Scientific calculator in VB.
12. Develop a VB application to either link or embed MS Word document to an OLE control.
13. Display Student information using Grid control.
15. Develop an application to perform the following operation in the Employee table using DAO.
   i) Add a new Record.
   ii) Delete a Record.
   iii) Modify a Record.

JAVA PROGRAMMING (ANY 8 EXPERIMENTS)

1. Program to print the following triangle of numbers
   
   1
   12
   123
   1234

2. Defining a class with the following attributes 1. xname 2. Date of Birth 3. Date on which leg injection has to be given (sixty days from date of birth) 4. xdate on which polio drops is to be given (45 days from Date of birth). Write a constructor to construct the baby object. The constructor must find out the leg and polio drops dates from the date of birth. In the main program define a baby and display its details.
3. Program, to create and display a message on the window.

4. Program to draw several shapes in the created window.

5. Program to create an applet and draw gridlines.

6. Java program to create a frame with two buttons called father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother appear.

7. Java program to create a frame with four text fields for name, age and qualification and a text field of multiple lines for address.

8. Program to draw circle, ellipse, square and rectangle at the mouse click position.

9. Java program to create four text fields for the name, street, city and pin code with suitable labels. Also add a button called my details, when you click the button your name, street, city and pin code must appear in the text fields.

10. Java program to demonstrate the multiple selection list boxes.

11. Program to create a canvas which displays a clock with hour hand and a minute hand depending upon an int variable minutes. Write another program with a frame, which displays the clock canvas. It must also have three buttons, tick, reset and close. When we click reset, the clock must reset to 12 hrs. When we click close, the frame closes.

12. Java program to create a menu bar and pull down menus.

13. Java program to create a window when we press M or m the window displays Good Morning A or a the window displays Good Afternoon E or e the window displays Good Evening N or n the window displays Good Night.

14. Java program to move different shapes (Circle, Ellipse, Square, and Rectangle) according to the arrow key pressed.

15. Java program to create a frame which responds to the mouse click. For each event with mouse (such as mouse up, mouse down etc) the corresponding message must be displayed.

16. Program to handle the divide by zero exception.

17. Program to explain the multithreading with the use of multiplication tables. Three threads must be defined and each one must create one multiplication table; they are 5 tables, 7 tables and 13 table.

18. Program to illustrate thread priority. Create three threads and assign three different priorities.
ELECTIVE I - A

HOME APPLIANCES AND SERVICING

(yet to be submitted)

ELECTIVE I - B

AUTOMOTIVE ELECTRONICS

UNIT I Introduction:
Automotive component operation Electrical wiring terminals and switching Multiplexed wiring systems Circuit diagrams and symbols. Charging Systems and Starting Systems: Charging systems principles alternations and charging circuits New developments requirements of the starting system Basic starting circuit.

UNIT II Ignition systems:

UNIT III Instrumentation Systems:
Introduction to instrumentation systems Various sensors used for different parameters sensing Driver instrumentation systems vehicle condition monitoring trip computer different types of visual display

UNIT IV Electronic control of braking and traction:

UNIT V Engine Management Systems:
Combined ignition and fuel management systems Exhaust emission control Digital control techniques Complete vehicle control systems Artificial intelligence and engine management Automotive Microprocessor uses. Lighting and Security Systems: Vehicles lighting Circuits Signaling Circuit Central locking and electric windows security systems Airbags and seat belt tensioners Miscellaneous safety and comfort systems

TEXT BOOK
1. TOM DENTON, Automobile Electrical and Electronic Systems, Edward Arnold pb., 1995
REFERENCES
2. WILLIAM, T.M., Automotive Mechanics, McGraw Hill Book Co.,

ELECTIVE I - C

PCB DESIGN AND FABRICATION

UNIT I TYPES OF PCB


UNIT II LAYOUT AND ARTWORK

Basic artwork approaches – Artwork taping guidelines – General artwork rules – Artwork check and Inspection.

UNIT III LAMINATES AND PHOTO PRINTING


UNIT IV ETCHING AND SOLDERING

Introduction – Etching machine – Etchant system.

UNIT V DESIGN RULES AND AUTOMATION

Reflection – Crosstalk – Ground and Supply line noise – Electromagnetic interference from pulse type EM fields and automation – Automated artwork drafting – CAD.
**Text Books:**

**ELECTIVE II - A**

**8085 MICROPROCESSOR INTERFACING AND ITS APPLICATIONS**

**UNIT I INTERFACING CONCEPTS**


**UNIT II DATA TRANSFER**

Data transfer schemes – Programmed data transfer – Synchronous Transfer, Asynchronous transfer, Interrupt driven data transfer, Multiple interrupts, Enabling, Disabling and Masking of interrupts, Direct memory access data transfer: DMA devices, DMA transfer in a 8085 based system – Serial data transfer.

**UNIT III PERIPHERALS**

The 8255A Programmable peripherals interface : Block diagram of 8255A, Mode 0 Simple i/p or o/p BSR mode, Programming the 8255A in mode1, mode 2 – Bidirectional data transfer – The 8359 Programmable Interrupt Controller Block diagram of 8259A Interrupt Operation, Programming the 8259, priority modes and other features, additional features of the 8259A.

**UNIT IV PERIPHERAL INTERFACES**

Block diagram of 8253 – Programming the 8253 – The 8253 as a counter – direct Memory access and the 8257 DMA Controller – 8279 Keyboard/Display Interfacing

**UNIT V APPLICATIONS**

TEXT BOOKS


ELECTIVE II - B

MICROWAVE AND OPTICAL FIBER COMMUNICATION SYSTEMS

UNIT I  INTRODUCTION TO MICROWAVES

UNIT II  MICROWAVE AMPLIFIERS AND OSCILLATORS
Microwave tubes: - Two cavity Klystron – Multi cavity Klystron – Reflex Klystron – Traveling wave tube (TWT) – Backward wave Oscillator (BWO) – Magnetron – Applications

UNIT III  MICROWAVE DEVICES

UNIT IV  RADAR

UNIT V  OPTICAL FIBER COMMUNICATION

TEXT BOOKS

REFERENCE

ELECTIVE II - C
ADVANCED COMMUNICATION SYSTEMS

UNIT I DATA COMMUNICATION

UNIT II PULSE COMMUNICATION

UNIT III SATELLITE COMMUNICATION
Inside Satellite: Transponder – Antenna System – Power Package and Station Keeping – Forms of Modulation – Free path space losses – Ground Station – Aligning the satellite dish

UNIT IV CELLULAR COMMUNICATION SYSTEM
Introduction Cellular Mobile System – Basic Cellular System – Operational Cellular System – Maximum number of Calls per cell – Maximum number of Frequency channels concept of frequency channel cell splitting – permanent splitting – real time splitting – Frequency Management – Channel Assignment

UNIT V OPTICAL COMMUNICATION
Introduction to Optical fibers – Optical fiber structure – Numerical aperture – Propagation of light rays through it – Application of Optical Fiber (Video link, Satellite link, Computer link, Communicating antenna Television link)

TEXT BOOKS:
5. Subir Kumar Sarkar “Optical Fiber Communication systems”, S.Chand and Company

ELECTIVE III - A

PROGRAMMABLE LOGIC CONTROL

UNIT I
Programmable Logic Introduction, programmable Logic structures Programmable Logic Arrays (PLAs), Programmable Array Logic (PALs), Programmable Gate Arrays (PGAs), Field Programmable Gate Arrays (FPGAs) Sequential network design with Programmable Logic Devices (PLDs) Design of sequential networks using ROMs and PLAs Traffic light controller using PAL.

UNIT II
Programmable Logic Controllers (PLCs) Introduction Parts of PLC Principles of operation PLC sizes PLC hardware components I/O section Analog I/O section Analog I/O modules, digital I/O modules CPU Processor memory module Programming devices Diagnostics of PLCs with Computers.

UNIT III
PLC programming Simple instructions Programming EXAMINE ON and EXAMINE OFF instructions Electromagnetic control relays Motor starters Manually operated switches Mechanically operated and Proximity switches Output control devices Latching relays PLC ladder diagram Converting simple relay ladder diagram in to PLC relay ladder diagram.

UNIT IV
Timer instructions ON DELAY timer and OFF DELAY timer counter instructions Up/Down counters Timer and Counter applications program control instructions Data manipulating instructions math instructions.

UNIT V
Applications of PLC Simple materials handling applications Automatic control of warehouse door Automatic lubricating oil supplier Conveyor belt motor control Automatic car washing machine Bottle label detection Process control application.

Text Books:
3. Siemens "PLC Handbook".

References:

ELECTIVE III - B

DESIGN WITH PIC MICROCONTROLLERS

UNIT I CPU Architecture and Instruction Set


UNIT II Loop Time Subroutine, Timer2 and Interrupts


UNIT III External Interrupts and Timers

RB0/INT External Interrupt input – Timer0 – Compare mode – Capture mode – Timer1/CCP Programmable Period Scaler – Timer1 External event counter – Timer1 and Sleep mode – PulseWidthModulated Outputs – PortB change interrupts.

UNIT IV I/O Port Expansion


UNIT V $I^2$ Bus for Peripheral Chip Access

$I^2$ Bus operation - $I^2$ Bus subroutines – DAC output – Temperature sensor – Serial EEPROM.

Text Books:
ELECTIVE III - C

COMPUTER HARDWARE AND MAINTENANCE

UNIT I  COMPUTER HARDWARE OVERVIEW


UNIT II  MOTHER BOARD FUNCTIONS


UNIT III  FLOPPY DISK CONTROLLER


Display adapter introduction – CRT display – 6845 CRT controller – CGA & AGA – Device interface

UNIT IV  HARD DISK CONTROLLER AND PRINTER

Introduction – Overview of HDC organization – Disc drives types and interface – Hard disk card – Hard disk format

Printer introduction: Centronics interface programming – Programming sequence – Hardware overview – Printer controller

UNIT V  TROUBLE SHOOTING


TEXT BOOK
