

# Microprocessor and Programming [MPO]

S.Y. Diploma : Sem IV  
[CO/CD/CM/IF]

## EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	50@
Oral Exam	–	–
Term Work	–	–
Class Test (Two Test)	–	25 (each)

@ Internal Assessment

## SYLLABUS

### 1. Basics of Microprocessor

Evolution of Microprocessor and types.

Silent features of 8085 Microprocessor, architecture of 8085 (Block diagram), register organization, limitations of 8-bit Microprocessor.

### 2. 16-bit Microprocessor 8086

Silent features of 8086 Microprocessor, architecture of 8086 (Block diagram, signal description), register organization, concepts of pipelining, memory segmentation and memory address generation. Minimum and Maximum Mode operation and diagram.

### 3. 8086 Instruction set

Machine Language Instruction format, addressing modes.

Instruction set (Arithmetic, logical, data transfer, bit manipulation, string, program control transfer, process control)

### 4. The art of assembly Language Programming

Program development steps defining problem, algorithms flowchart, initialization checklist, choosing instructions, converting algorithms to assembly language programs.

Assembly Language Programming Tools Editors, Assembler, Linker, Debugger.

Assembler directives, model of 8086 assembly language programming, programming using assembler.

### 5. Procedure and Macro

Defining Procedure (Directives used, FAR and NEAR, CALL and RET instructions)

Reentrant and Recursive procedures

Defining Macros.

Assembly Language Programs using Procedure and Macros.

### 6. System Interfacing

Interfacing Techniques (I/O mapped I/O, Memory mapped I/O, memory and I/O addressing, 8086 addressing, and address decoding, memory interfacing as Even and Odd bank)

**Reference Books :**

1. Microprocessor & Interfacing (Programming & Hardware) (*Douglas V. Hall*) Tata McGraw Hill.
2. Advanced Microprocessor & Peripheral (*A.K. Ray & K.M. Bhurchandi*) Tata McGraw Hill.
3. An Introduction to the Intel Family of Microprocessors (*James L. Antonakos*) Pearson Education Asia.
4. Microprocessor Architecture Programming & Application with the 8085 (*Ramesh A. Gaonkar*) Penfam International.
5. Website : [www.intel.com](http://www.intel.com)
6. Website : [www.pcguid.com/ref/CPU](http://www.pcguid.com/ref/CPU)
7. Website : [www.CPU-World.com/Arch/](http://www.CPU-World.com/Arch/)
8. Website : [www.techsource.com/engineering-parts/microprocessor.html](http://www.techsource.com/engineering-parts/microprocessor.html)



# Computer Network [CNE]

S.Y. Diploma : Sem IV  
[CO/CD/CM/IF]

## EVALUATION SYSTEM

	Time	Marks
<b>Theory Exam</b>	3 Hrs.	100
<b>Practical Exam</b>	–	–
<b>Oral Exam</b>	–	–
<b>Term Work</b>	–	25@
<b>Class Test (Two Test)</b>	–	25 (each)

@ Internal Assessment

## SYLLABUS

### 1. Basic Network Concepts

Understanding Network – Human Networks, Computer Networks, Network Plan.  
Identifying the Benefits of Network – Sharing Information, Sharing Resources, Facilitating Centralized Management – Management Software, Maintaining the Network, Backing Up Data.  
Distinguishing Between Network classifications – Classifying Networks by their Geography – LAN, MAN, WAN, Classifying Networks by their Component Role – Peer to Peer, Server based Network.  
Network Features – File Sharing, Printer Sharing, Application Services, E-mail, Remote Access.

### 2. Network Topologies and Networking Devices

Type of Topology – Bus Topology, Ring Topology, Star Topology, Mesh Topology, Tree Topology, Hybrid Topology.  
Network Control Devices – Hubs, Switches, Routers, Bridges, Repeaters, Gateways, Modems.

### 3. Transmission Media

Guided Media – Twisted Pair– UPT, STP, Coaxial Cable, Optical Fiber – Optical Fiber Structure, Light Source for Fiber, Propagation Mode, Advantages of optical fiber, Disadvantages of optical fiber.  
Un-Guided Media : Wireless Communication – Communication Band, Microwave Communication, Satellite Communication – Access Method, Cellular (Mobile)  
Telephone – Band in Cellular Telephony, Calls Using Mobile Phones, Transmitting receiving operations, New Developments.

### 4. Network Reference Model

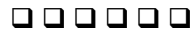
OSI Reference Model – Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical Communication, Encapsulation Terminology, Physical layer, Data link layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer.  
TCP/IP Reference Model - Link, Internet, Transport, Application layer.  
Comparison of the OSI and TCP/IP reference models.

### 5. TCP/IP Fundamentals

TCP/IP Protocols – SLIP and PPP, ARP, IP, ICMP, TCP and UDP.  
IP Addressing – IP Address Assignments, IP Address Classes, Subnet Masking, Registered and unregistered Addresses.

**Reference :**

1. Computer Networks (*Andrew S. Tanenbaum*) Tata McGraw-Hill Edition
2. Introduction to Networking (*Richard A. McMohan, Sir*) Tata McGraw Hill
3. Networking + Certification (*Microsoft Press*) (2<sup>nd</sup> Edition)
4. Complete Reference Networking (*Craig Zacker*) Tata McGraw Hill Edition.
5. Data Communication and Networking (*Achyut S. Godbole*) Tata McGraw Hill Edition.
6. Data Communication (*Behrouz Forouzan*) Tata McGraw-Hill Edition.
7. CDs : Books of MCSE of Microsoft Publication gives CD. Demonstration of this CD for understanding basic concept.



# Data Structure [DST]

S.Y. Diploma : Sem IV  
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@ Internal Assessment, # External Assessment

## SYLLABUS

### 1. Introduction to data structure

Data Representation

- Abstract data Types
- Data Structures (Linear and Non- Linear )
- Atomic Type

Data Types

- Primitive data type
- Derived data type

Operations on data structures

- Traversing, Inserting, Deleting
- Searching and sorting

### 2. Principles of programming and Analysis of Algorithms

Algorithms

- Different approaches for designing an algorithm
- Complexity in terms of time and space
- Big 'O' Notation.

### 3. Searching & Sorting

Sorting

- An Introduction
- Efficiency of Sorting Algorithms

Sorting Techniques

- Bubble Sort
- Selection Sort
- Insertion Sort
- Merge Sort
- Radix Sort (only algorithm)
- Shell Sort (only algorithm)
- Quick Sort (only algorithm)

Searching

- An Introduction
- Linear search
- Binary Search.

#### 4. Stacks

Introduction to Stacks

- Stacks as an Abstract Data Type
- Primitive operations of stacks

Representation of Stacks through Arrays

Application of Stacks

- Stack machines
- Recursion.
- Arithmetic expression: Polish Notation.

#### 5. Queues

Introduction

- Queue as an Abstract Data Type
- Representation of Queues

Operations on queue : Searching ,Insertion, Deletion.

Types of queues

- Circular Queues
- Priority Queue
- Dequeues

Application of Queues.

#### 6. Linked List

Introduction

- Terminologies Node, Address, Pointer, Information, Next, Null pointer, Empty list etc.  
Operations on list Searching, Insertion and Deletion

Types of lists

- Linear list
- Circular list
- Doubly list

Array stacks, queues, implementation using list.

#### 7. Trees

Introduction to Trees.

Types of Trees

- General Trees
- Binary Trees
- Height balanced
- Weight balanced
- Binary Search Tree

Operations on Binary Search Tree

- Insertion of node
- Deletion of node
- Traversal—In-order, pre-order and post-order
- Searching Depth-first search and Breadth-first search.

#### 8. Graphs

Introduction

- Terminology graph, node (vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, weight, path, length.

Sequential Representation of Graphs.

Linked Representation of Graphs.

Traversal of Graphs.

- Depth-first search
  - Breadth-first search
- Shortest Path algorithm for graph.  
Application of Graph.

## 9. Hashing

Hash functions,  
Deleting items from hash tables.

### Reference Books :

1. Data Structure using 'C' (*ISRD Group– New Delhi*) Tata McGraw Hill.
2. Data Structure (*Tremblie & Sorrenson*) TMH Publications.
3. Teach Yourself Data Structure & Algorithms in 24 Hrs. (*Lafore*) BPB Publication.
4. Data Structures using C++ (*Tannenbaum*) PHI Publication
5. Data Structures (*Seymour Lipschutz*) Tata McGraw Hill



# Computer Graphics [CGA]

S.Y. Diploma : Sem IV  
[CO/CD/CM]

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<b>Theory Exam</b>	3 Hrs.	100
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@ Internal Assessment

## SYLLABUS

### 1. Basics of Computer Graphics

Raster scan display: Frame buffers:

- Rotating memory frame buffer
- Shift register frame buffer
- Random access frame buffer
- Multiple plane frame buffer

Display devices: Construction an Random scan display,

working of following devices: CRT, Beam penetration CRT, Shadow mask CRT, DVST, Plasma panel, Liquid crystal display.

Primitive operations: - moveto, lineto

The Display-file interpreter, Display file structure, Graphics file formats: general explanation, advantages, disadvantages :

- **BMP**
- **GIF**
- **JPEG**
- **TIFF**
- **PCX**

Text mode graphics function, Graphic mode graphics functions. Shapes, colors, Co-ordinate systems, Applications of computer graphics.

### 2. Line, Circle and Polygon

Basic concepts in line drawing, Line drawing algorithms : DDA algorithms, Bresenham's algorithm.

Circle generating algorithms : DDA circle drawing algorithm, Bresenham's circle drawing algorithm, midpoint circle algorithm.

Polygons – Types of polygons, Polygon representation, Entering polygons, inside – outside test, polygon filling : Flood fill, scan-line algorithm.

### 3. Transformations

2D transformation : Scaling, Reflection, Shearing, Rotation, Translation, Rotation about an arbitrary point.

3D Transformation : Scaling, Rotation, Translation, Rotation about arbitrary axis.

### 4. Windowing and Clipping

Viewing transformation, Normalization transformation.

Line clipping : Cohen–Sutherland, Line clipping algorithm, midpoint subdivision algorithm.

Polygon clipping : Sutherland – Hodgeman Polygon clipping algorithm. Sample problems with sample coordinates to illustrate above algorithms



## 5. Curves and fractals

Curve generation : arc generation using DDA algorithm. Interpolation, B-Spline, Bezier curves.  
Properties, Cubic Bezier curves  
Fractals : Hilbert's Curve, Koch curve, Fractal lines, Fractal surfaces.

## 6. Raster Graphics and Interactive Graphics

Need for graphics standards, Graphics standards:

CORE

GKS

PHIGS

IGES

CGM

VDI

Advantages of Graphics standards, Hazards of Graphics standards.

Graphical user interface : Introduction

- Example

- Features of GUI

- Principles for good GUI design

## Reference Books :

1. Computer Graphics (*ISRD Group*) Tata McGraw Hill.
2. Computer Graphics (*A.P. Godse*) Nirali Prakashan Technical Publications.
3. Computer Graphics (*Steven H. Arington*) McGraw Hill
4. Computer Graphics (*M. Pauline Baker & Donald Hearn*) Prentice-Hall.
5. Graphics Under 'C'.
6. Principles of Interactive Computer Graphics (*Newman & Sproull*) Tata McGraw Hill.
7. Computer Graphics (*Plastock*) Tata McGraw Hill.
8. Website : [www.insidecg.com](http://www.insidecg.com)
9. Website : [www.graphics.standard.edu](http://www.graphics.standard.edu)
10. Website : [www.cmp.uea.ac.uk.research](http://www.cmp.uea.ac.uk.research)
11. Website : [www.computerarts.co.uk](http://www.computerarts.co.uk)
12. Magazines : Computer Graphics World
13. Magazines : In-plant Graphics
14. Magazines : Computer Arts



# Computer Architecture and Maintenance [CAM]

S.Y. Diploma : Sem IV  
[CO/CD/CM/IF]

## EVALUATION SYSTEM

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<b>Oral Exam</b>	–	25#
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@ Internal Assessment, # External Assessment

## SYLLABUS

### 1. Motherboard And its Components

Chipset basic, chipset Architecture: North / South Bridge architecture and Hub architecture.  
Architecture of Intel chipset 915 G & 945 G  
Overview and features of ISA, PCI-X, PCI-X press, AGP, PCMCIA, AGP, Processor BUS (no pin description) PCI versus PCI Express  
Logical memory organization: Conventional memory, Extended memory, Extended memory, upper memory (No memory map)  
Concept of cache memory : Internal cache, External cache (L1, L2, L3 cache)  
Overview and features of SDRAM, DDR, DDR2, DDR3  
Features of Intel processors : Pentium, P2, Celeron, P3, P4, Pentium D and AMD processors : K6, Athlon XP, Athlon 64  
Processor Modes : Real mode, Protected mode, Virtual real mode, 64 bit extension mode (AMD 64, EM 64)  
Bios Basics, main functions  
Motherboard Selection criteria

### 2. Storage Devices and its Interfacing

Recording Technique : FM, MFM, RLL Perpendicular magnetic recording  
Hard disk construction and working  
Servo Techniques : Wedge servo, Embedded servo, dedicated servo  
Terms related to Hard Disk : Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, write precompensation  
Formatting, Low level formatting, High level formatting, partitioning  
FAT basics, Introduction to file system FAT 16, FAT 32, NTFS  
Hard disk drive interface : features of parallel AT attachment (PATA), Serial ATA (SATA), ATA devices jumper selections: Master, slave, cable select, ATA cables  
ATA RAID : RAID 0, RAID  
CDROM drive : Construction, Recording  
DVD : Construction, Recording  
Blu-ray disk specification

### 3. Display Devices and Interfacing

CRT colour monitor : Block diagram and function of each block  
Characteristics of CRT monitor : Dot pitch, Resolution, Video bandwidth, Horizontal scanning frequency, vertical scanning frequency, Interlaced versus non interlaced monitor  
Advantages of CRT display related to LCD display

LCD monitor : functional block diagram of LCD monitor, working principal, advantages and disadvantages  
Types : Passive matrix and Active matrix, Important characteristics : Resolution, Refresh rate, Response time  
Basic block diagram of a video accelerator card.

#### 4. Input and Output Devices

Construction and Working :

Keyboard : Types of keyswitches : Membrane, Mechanical, Rubber dome, Capacitive and interface

Mouse : Mechanical, Optomechanical, optical (New design)

Scanner : Flat bed, sheetfed, Handheld : Block diagram and specifications, OCR, TWAIN, Resolution, Interpolation

Modem : Internal and External : Block diagram and specifications

Printer : Dot matrix, Inkjet, Laser : Block diagram and specifications.

#### 5. Power Supplies

Block diagram and working of SMPS.

Signal description and pinout diagram of AT and ATX connectors

Power supply characteristics : Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation

Power problems : Blackout, Brownout, surges and spikes

Symptoms of power problems

Protection devices : circuit breaker, Surge suppressor : working UPS : Block diagram, working, Types, Ratings.

#### 6. Interfaces

SCSI, SCSI cables and connectors, SCSI drive configuration.

USB features

RS232 : (Voltages and Signal description)

Centronics (interface diagram, important signals and timing waveform).

Firewire features.

#### 7. PC Diagnostic, Testing and Maintenance and Tools

Preventive Maintenance : Active, Passive, periodic maintenance procedure

Preventive maintenance of peripherals of PCs.

Fault finding and troubleshooting of the above peripherals

ESD (Electrostatic discharge), RFI protection, Earthing

Diagnostic software

Working of logic probe, logic pulser, current tracer

Block diagram and working of logic analyzer & CRO

Virus infection symptoms, precautions to prevent a virus infection

#### Reference Books :

1. Managing & Troubleshooting PCs (*Mike Meyers, Scott Jernigan*) Tata McGraw Hill.
2. Bigelow's Troubleshooting, Maintaining & Repairing PCs (*Bigelow*) Tata McGraw Hill.
3. The Complete PC Upgrade & Maintenance Guide (*Mark Minasi*) BPB Publication.
4. Computer Installation & Servicing (*D. Balasubramanian*) Tata McGraw Hill.
5. Upgrading & Repairing PCs (*Scott Mullar*) Techmedia.

