SYLLABUS FOR TECHNICIAN (BCA, MCA, B.E Com sc, IT)

1.0 INTRODUCTION TO COMPUTERS

1.1 Generations of Computers:
- First generation
- Second Generation
- Third generation
- Fourth generation

1.2 Classification of Computers:
- Super-computers
- Mainframe computers
- Mini computers
- Workstations
- Microcomputers

1.3 Data representation and Number systems:
- Binary digit-Bit, Byte, Nibble, Word
- Binary Coded Decimal (BCD)
- ASCII
- Number systems-Binary, Octal, Decimal, hexadecimal
- Conversions of Binary to Decimal system and vice versa
- Binary operations-addition, subtraction, 1's complement and 2's compliment

1.4 Basic organization of a Computer system:
- Functional Block diagram
- Input unit
- Output unit
- Central Processing Unit-Main memory, ALU and CU
- Mass Storage unit

2.0 INPUT AND OUTPUT DEVICES

2.1 Input devices:
- Keyboard
- Mouse- Scroll mouse, optical mouse
- Scanners- Optical character reader, bar-code reader

2.2 Output devices:
- Monitors/VDU-Cathode ray tube, Liquid Crystal display
- Printers- Dot Matrix printer, Laser printer, Inkjet printer, Plotters

3.0 STORAGE DEVICES

3.1 Non-Volatile memory
- ROM, PROM and EPROM

3.2 Volatile memory
- Registers, Cache memory, Main memory RAM

3.3 Comparative study of Cache memory, Primary storage and Secondary storage w.r.t. storage capacity and speed.

3.4 Different between SDRAM and DDR RAM

3.5 Magnetic storage device
- Floppy disk drives
- Hard disk drive-different components and their functions, organization of data and drive interface.

3.6 Optical storage device
- CD/DVD drives-organization of data read/write mechanism.

4.0 COMPONENTS OF MOTHERBOARD

4.1 Memory controller hub
- System bus
- Processor socket
- DIMM slot
- Advanced Graphic Port

4.2 Input/Output controller hub
- Primary/Secondary IDE channel
- Peripheral Component Interconnect
- Serial and Parallel post
- PS/2 ports
- USB ports

4.3 BIOS ROM

4.4 CMOS battery

4.5 Real time clock

4.6 SMPS connector

5.0 COMPUTER NETWORKS

5.1 concept of computer network
- Local Area Networks
- Metropolitan Area Networks
- Wide Area Networks

5.2 Transmission modes:
- Simplex mode
- Half-duplex mode
- Full-duplex mode

5.3 Transmission Media:
- Co-axial cable
- Twisted pair-UTP and STP
- Optical Fiber

5.4 Network Topologies:
- Bus topology
- Star topology
- Ring topology
- Mesh topology

5.5 Network Architectures:
- Peer to Peer Networks
- Client Server networks

5.6 Network connectivity devices:
- MODEM
- Repeater
- Routers
- Bridge
- Gateway

5.7 OSI reference model of data communication:
- Physical layer
- Data Link layer
- Network layer
- Transport layer
- Session layer

- Presentation layer
- Application layer

5.8 Standards and Protocols:

- TCP/IP Protocols
- NetBEUI Protocols
- IPX/SPX Protocols
- IEEE Standards

6.0 INTERNET TECHNOLOGY

6.1 Basics of Intranet and Internet

6.2 Services provided by the Internet

- Email
- Chatting (textual/voice)
- Bulletin Boards
- Video conferencing
- FTP (uploading and downloading files)
- Telnet

6.3 World Wide Web:

- Web-Site Access and Information Search
- Browsers and search engines

6.4 Internet Connectivity:

- Internet Service Provider (ISP)
- Internet accounts and its features – Dial-up, Leased line, ISDN, VSAT

7.0 COMPUTER LANGUAGES:

7.1 Analogy with natural languages

7.2 Characteristics of a good Language

7.3 Classification of languages

- Machine language
- Assembly language
- High-level language

8.0 COMPUTER SOFTWARE:

8.1 Relationship between hardware and software

8.2 Classification of Software

8.3 System software – Operating system, Compiler & Interpreter

8.4 Application software-MS Office, Adobe PageMaker, PhotoShop etc.

8.5 MS Office

- MS WORD (Word Processing software)
- MS EXCEL (Spreadsheet/Data analysis software)
- MS POWERPOINT (Presentation software)
- MS ACCESS (Database software)

8.6 MS WORD

- About MS Word
- Starting MS WORD
- Components of MS Word window
- Creating and Editing document
- Formatting text
- Inserting Symbols, Picture and Word Art
- Tab settings, Borders and Shading
- Header and Footer-Footnote and Endnote
- Drawing basic shapes
- Inserting Text Box, Callouts, Captions

 Drawing with Tables
 Advanced WORD features
- Auto correcting, Spelling and Grammar check
- DropCap
- Creating Multiple Columns
- Mail Merge

8.7 MS EXCEL
 Features of MS EXCEL
 Components of EXCEL window
 Creating and naming Worksheets
 Formatting and Editing
 Using Formulas
 Types of Functions
 Sharing and Managing Data
 Working with Chart-Chart components, Chart types, 3d Chart

8.8 MS POWERPOINT
 About Powerpoint
 Different components in PowerPoint window
 Different views
 Using Design Templates
 Creating a new presentation
 Creating a Title Slide
 Formatting a Slide
 Applying Transition effects
 Using action button
 Animating and customizing animation

8.9 MS ACCESS
 About Access and Access database
 Planning database structure
 Creating a database
 Adding records to a database
 Querying a database
 Creating forms
 Creating Reports

9.0 COMPUTER VIRUSES

9.1 Introduction
9.2 Types of viruses
 Command processor infection
 Boot sector infection
 Executable file infection
 File-specific infection
 Memory resident infection
 Macro viruses
9.3 Protecting the PC from viruses
9.4 Recognizing an infection
9.5 Dealing with an infection

PAPER ll

1.0 Operating system

- Definition

- Function of OS
- Evolution of operating systems
 Sequental processing
 Batch processing
 Multi programming
 Multi processing
 Real time
 Multi tasking
- Process concept
 CPU scheduling-First come first served, Shortest job first, Priority, Round Robin, Multiprocessor scheduling
- memory management
- I/O Systems and mass Storage Structure
- Disk Operating system
 Features & characteristics of MS DOS
 Booting, system files, BIOS
 Files and directory
 Internal commands
 External commands
 Meaning of BAT, EXE and COM files
- Windows Operating System
 Concept of Windows- Arranging, Moving, Resizing, Opening and Closing of windows
 Folder/File management-Search, copy, delete and rename files and folders Restore
 Windows Accessories-Notepad, Word Pad, Paint
 Overview of different versions of MS Windows OS

2.0 UNIX-OPERATING SYSTEM

- History and development of UNIX OS
 Features, Structures of UNIX OS
 Kernel, Shell, Applications Utilities
 Hardware requirements for Installation
- Essential UNIX Commands
 Startup & Shutdown Process
- Booting Procedure with different stages, Login process, password concept, who, who am I, tty, date and cal commands, system shutdown.
 File concept
- File types in UNIX, Hierarchical directory structure, File system structure.
 File creating, displaying, concatenating and copying
 Creating and changing directories, removing files and directories
- CD, CP, MD, RM, MKDIR, CAT
 File processing commands
- Wc, head, tail, cut, paste join, split, sort, grep, egrep, tr, comm., cmp, diff, more, less commands
 File formatting and printing commands-pr with options, lp commands
 Online help facilities in UNIX- Use of man and help command
 Mathematical commands-bc, expr, factor, units
 Communication commands

- User to user communication using write, mailing using mail, broadcasting messages using wall.

3.0 DATABASE MANAGEMENT SYSTEM

- Basic concepts of Data and Information
- Database
- Database management System
- Database Administrator
- Functions of DBMS

- Relational Databases
- Relational system, the relational model, optimization, base tables and views, the SQL language

- Relational Data Objects
- Domains and relations: domains, relations. And kinds of relations, relations and predicates, relational database

- The Entity/Relationship Model
- Introduction, the overall approach, an overview of the E/R model, E/R diagrams, database with the E/R model

- SQL Language
- Introduction, data definition, data-manipulation, retrieval operation, data manipulation-update operation, table expressions, conditional expressions, scalar expressions, embedded SQL

- Database security
- Introduction, authentication, authorization, and access control, enforcement

4.0 SYSTEM ANALYSIS AND DESIGN

4.1 Introduction
- System concept: Definition
- Characteristics of a system
- Elements of a system
- Types of system: Physical system, Abstract systems, Open system, Closed systems
- Information system

4.2 System Development Life Cycle
- Introduction
- Different phrases/stages in system development Life Cycle
- Role of the system Analyst
- Factors affecting failure in SDLC

5.0 PROGRAMMING IN 'C' LANGUAGE

5.1 Introduction
- History and features of C
- Algorithms
- Flowcharts
- Structural programming Concepts

5.2 Operations & Expression
- Character set of C
- Operators and Expressions-Arithmetic, Relational, Logical assignment operators, variables, constants, data types, expressions, data types conversion, key words, hierarchy of operators

5.3 Input & Output Statements
- 'C' Programme structure, Type declaration, Input and Output, (printf,

scanf, getchar, putchar, getch, putch), Conversion specifiers in format control string, Library functions (Math functions)

5.4 Control Statements

 Unconditional branching, goto statement

 Conditional branching statements: if statement, if-else, Nested 'if'

 Multiple branching statements: switch case statement

5.5 Control Loop Statements

 Loop Statements: 'for' statement, while statement, 'do-while' statement, 'break-continue' statement

5.6 Arrays & Strings

 Arrays:

- Concept of one dimensional, two dimensional and Multi-dimensional array, array declaration, Array and initialization, operations on one and two-dimensional arrays.

String Manipulations

- Strings, get, puts, string operations, string function (concatenation, comparison, length of a string).

5.7 Functions

 Library and User- Defined functions

- Concepts of library functions, user-defined Functions, local and global variables, storage class, parameter passing mechanisms

6.0 OBJECT ORIENTED PROGRAMMING

6.1 Introduction

 Procedure-oriented programming versus Object-Oriented programming concept

 Basic concepts of OOPs

 Object oriented languages

 Beginning with C++

 Concept and structure of C++ programming

 Introduction to structures & Union of C

6.2 Objects and Classes

 Classes

- Specifying a class and types of class
- Defining and nesting member functions
- Arrays within a class

 Objects

- Creating objects
- Memory allocation for objects
- Static data and member function
- Array of objects
- Objects as function arguments

6.3 Constructions and destructors

 Constructors

- Parameterized
- Multiple
- Constructor with detail argument
- Dynamic

 Destructor

- Operator overloading and type conversion
- Inline functions overloading

- Overloading unary and binary operators
- Rules for overloading operators

6.4 Inheritance

 Introduction
 Derived classes
 Member declaration: protected
 Types of inheritance

- Single
- Multilevel
- Hierarchical
- Hybrid inheritance

 Virtual base classes
 Abstract classes
 Constructors in derived classes
 Member classes

6.5 Polymorphism

 Introduction

- Polymorphism in programming languages
- Types of polymorphism
- Polymorphic variables

 Overloading and overriding
 Virtual functions
 Static and dynamic binging

6.6 Pointers in C++

 Concept of Pointers

- Pointer declaration
- Pointer operator
- Address operator
- Pointer expressions
- Pointer Arithmetic

 Pointers and Functions

- Call by value
- Call by reference
- Pointer to functions
- Passing function to another function

 Pointers in Arrays-Searching, Insertion and Deletion
 Pointers To String

- Searching, Insertion and Deletion
- Finding length and comparison

 Pointers and objects

- Pointers to objects
- This pointer
- Pointers to derived classes

6.7 Internet Technology

 I/O system basics

- The stream classes
- Templates classes
- Character based classes
- Using manipulator to format I/O

 File handling
 File system Basics
 Opening and closing a file, Reading and writing a character from a file using fputs, fgets, rewind(), ferror, erasing file

6.8 Graphics in C++

 Text mode graphics functions-Window function, cputs(), clrscr()
 Graphics mode graphics functions:- initgraph(), circle(), closegraph()
 Shapes

- Set colours, set lines styles, set fill style, flood fill Colours
- Line and Rectangle: Line(), Rectangle()