

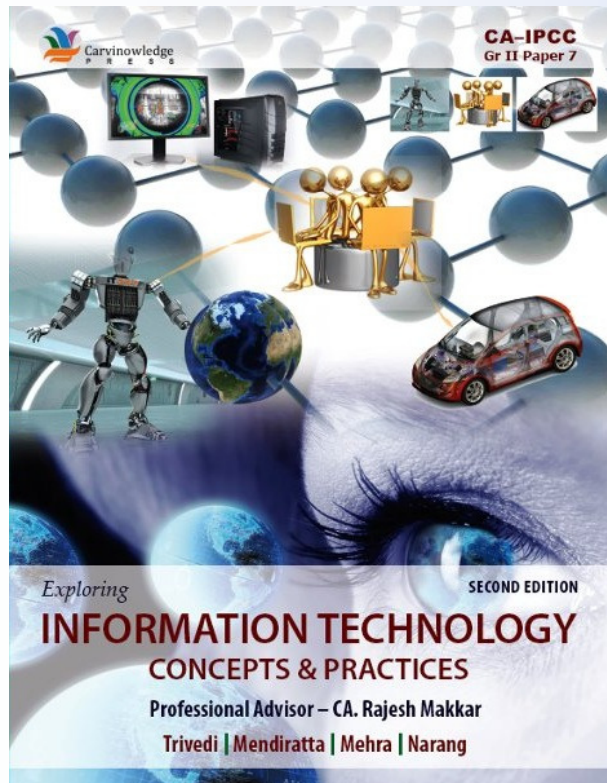
EXPLORING INFORMATION TECHNOLOGY

CA IPCC Paper: 7 A

IT Marks: 50

**Book Name: Exploring Information
Technology Concepts And Practices**

Software Chapter Notes



**Copyright: Navneet Mehra,
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Executive Secretary, Cyber Crime Awareness Society**

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Software

- **Software is a set of programs that instructs hardware what to do**
- **Program is a collection of instructions in any computer language to perform system related or application based task.**

*** For types of Software: Refer the chart in the book**



Programming Language

- **1st Generation (Machine Language)**
- **2nd Generation (Assembly Language)**
- **3rd Generation (High Level Language)**
- **4th Generation (Non-Procedural Language)**
- **5th Generation Language**

Check Quick reference table on next page



Programming Languages (Quick reference)

Parameter	Machine Language(1st)	Assembly Language (2nd)	High level(3rd)	Non-procedural(4th)
Character Format	0 & 1	Symbols	Plain english words	Plain english words
Language translator used	None	Assembler	Compiler	Compiler/Interpreter
Execution	Very fast	Slower than 1 st gen.	Slower than 2 nd gen.	Slow
Portability	Not	Not	Less	High
Development cost	Highest	Less than 1 st	Moderate	Lowest
Program debugging	Very difficult and time consuming	Less difficult than 1 st	Easy and less time consuming	Easiest and fastest



Fifth Generation Language

- Used mainly in artificial intelligence research and development of neural network
- Can have ability to think for themselves and draw their own decision
- Example: Prolog(Logic programming), OPS5, Mercury

*If required go through the text in the book as well once.



Object Oriented Programming Language

- A technique for creating common building blocks of program called objects and assembling different set of objects to solve problems
- Provides graphical user interface therefore easier to use.
- More reliable, faster development and contain less errors as modules used in program are already tested.
- Example: C++ or Java



Operating System

OS is a system software responsible for:

- **Providing comm. b/w man and machine**
- **Comm. b/w machine and machine**
- **Control hardware devices**
- **File management**
- **Fault monitoring**
- **Virus checking**



Functions of Operating System

1. **Memory Management:** Allocates both primary and auxiliary memory for different tasks, data and programs.
2. **Processing Management:** Manages different processing tasks like execution of programs, data transfer between different devices, etc.
3. **Hardware (devices) and Software (applications) Management:** Efficient management of all peripheral devices, like printer, hard-disk etc and different applications/software efficiently like MS Office, printer's software, etc.
4. **File Management:** Protects files from loss and corruption - allocation of space for file storage and features like multi-sharing for same file
5. **Security Management:** Provides the features for managing the security of both the users and data on the computers. 6
6. **Job scheduling:** Can execute many tasks simultaneously and it maintains track of resources used by multiple jobs/tasks being executed simultaneously.

TYPES OF OPERATING SYSTEM

DOS(Disk Operating System):

- Most popular OS for IBM compatible PC
- Command based
- Some commands: DIR, FORMAT, COPY etc

Microsoft Windows

- Most popular operating system
- Provide graphical user interface
- Support multitasking—execute more than one program concurrently
- Also used on servers supporting applications such as web server and database server
- Popular version: Windows XP(experience), Windows 7
- Latest version: Windows 8

TYPES OF OPERATING SYSTEM

UNIX:

- Mainly used in bigger size machines like mainframe.
- Developed by AT&T bell labs in 1969
- Portability, multiuser, multitasking etc are features
- Does not has GUI

Linux

- Another version of Unix
- Released as open source license so anyone can read and modify the code
- Widely used in Servers

Mac OS

- GUI Based OS from Apple in 1984
- Comes in client and server editions



Important Terminologies

Multiprogramming:

- ❖ Execution of two or more computer programs by single processor
- ❖ Main purpose- increase utilization of computer
- ❖ Require high processing speed of CPU, time sharing mode is there

Multiprocessing or Parallel Processing

- ❖ Simultaneous execution of two or more programs by two or more CPU
- ❖ More costly and complex than multiprogramming
- ❖ Example: Supercomputer



Important Terminologies

Multitasking:

- ❖ Concurrent execution of two or more task on a single user computer
- ❖ Place two or more task in main memory and execute them concurrently
- ❖ Multitasking is multiprogramming on single user system
- ❖ Example: Windows on personal computer

Multithreading

- ❖ Allow to run different part of one program concurrently
- ❖ Can perform several similar tasks on single server
- ❖ Example client request for web pages, images, sound etc.



Important Terminologies

Virtual Memory:

- ❖ Not an actual physical memory
- ❖ Program broken up into fixed or variable size length pages called segments
- ❖ Overlaying- executed pages replaced by unexecuted pages



Utility Programs

Used for executing some specific utilities- also known as service program or system utilities

***Refer book for more on this as its discussed well in points in the book**



Language Translator

Compiler

- Translates a program from one computer language (high level language) into a program in another computer language (machine language)
- Translates entire program before its executed.
- Example: COBOL, FORTRAN

Assembler

- Translate assembly language into machine language
- Input is source code and output is object code
- Produces one machine-instruction for each assembly-language instruction

Interpreter

- Converts and executes a high level language program, statement by statement
- Inefficient and slow in operation than compiler
- Error found quickly, require less storage

Also check differences between compiler and interpreter

General Purpose Software

- ❑ Used in large number of business scientific and personal applications
- ❑ Consist of commercial, shareware and open source software
 - ❑ Commercial: Comes prepackaged and is available from software stores or Internet. example: Tally
 - ❑ Shareware: Develop by individual and small companies. Available for small time as trail version and then need to be purchased
 - ❑ Open source: created by professional programmers and released into public without any cost but ownership stays with them
- ❑ **Word Processor:** Generally used to prepare document files(.doc) which have feature like editing, deleting, copying etc. Example: Ms-word
- ❑ **Spreadsheet program:** Rectangular(or grid) table of information- contains rows and columns. Example: MS- Excel
- ❑ **DBMS:** Software to manage database. Example: Oracle, MS- Access
- ❑ **Internet Browsers:** Software application that enables user to access internet



Application Software

❑ Solve particular problem unique to a organization like payroll, inventory control and general accounting

❑ Major types:

❑ ERP(Enterprise Resource Planning)

❑ Decision Support system (DSS)

❑ Expert System

❑ Artificial Intelligence

ERP

ERP

Software solution that tightly integrate all functions of enterprise

Integrate all data and process into single system

Provides one database, one application and one user interface for entire enterprise

Integrates 5 major resources- man, material, money, machine and market

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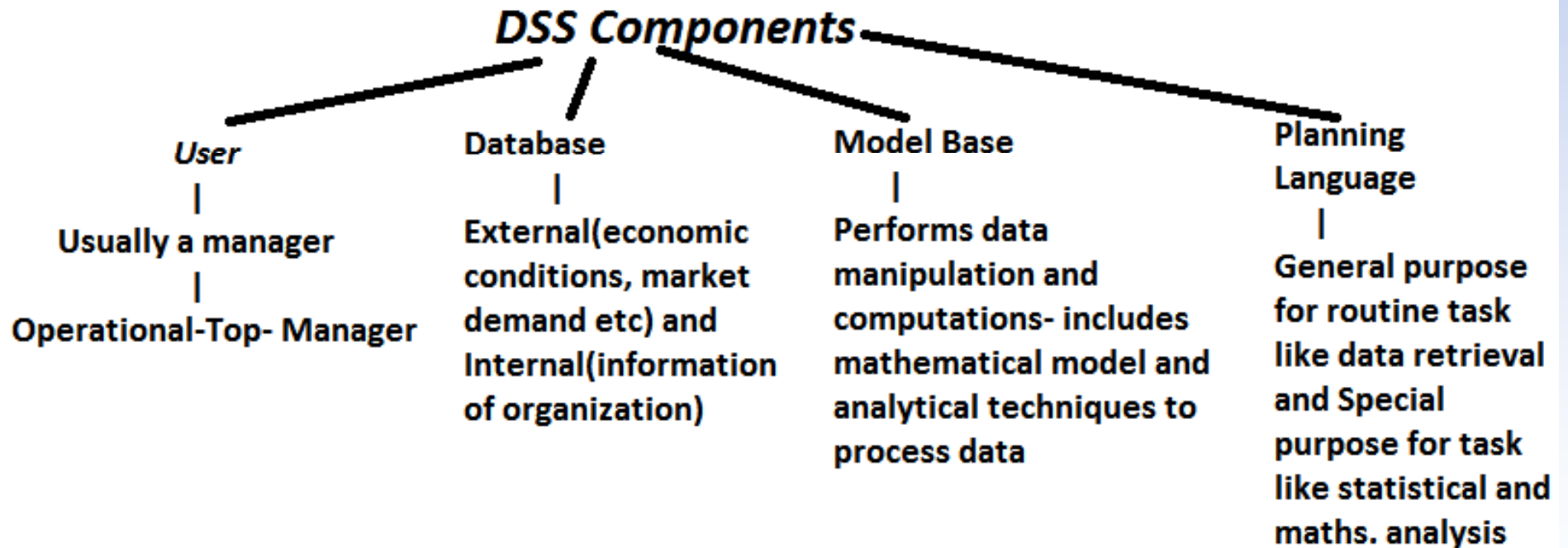


DSS (Decision Support System)

- ☐ Interactive, Flexible and adaptable computer based information system for improving decision making
- ☐ Frequently used by accountants, managers to assist in decision making process.
- ☐ Supports management decision making:
 - ☐ Operational level managers- for scheduling job decisions
 - ☐ Top level managers- for policy decisions
 - ☐ Financial managers- for budgeting decision
- ☐ Solve problem where complete info. Not available

Components of DSS

V.
IMP



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Components of Expert System

1. User interface: This allows the user to design, create, update, use and communicate with the expert system.
2. Inference engine: This contains the basic logic and reasoning part of the system to arrive at solution for problem provided by user by matching the problem solution from knowledge base.
3. Explanation facility: Explanation of logic used to arrive at its conclusion is given here.
4. Knowledge base: This includes the data, knowledge, Relationship, and decision rules used by experts to solve a particular type of problem. It is the computer equivalent of all the knowledge and insight that an expert or a group of experts develop through years of experience in their field.
5. Knowledge Acquisition facility: This component is used for building knowledge base of an expert system. This component is used by programmer for collecting and organizing knowledge and expertise of human experts in the knowledge base.



Artificial Intelligence

- The branch of computer science that deals with writing computer programs that can solve problems creatively.
- Application software attempts to emulate aspects of human behavior like reasoning, seeing, hearing etc.
- Example: Natural language, voice and visual recognition, robotics etc.



Read from Book

Beside the key topics, there are couple of topics you should have a read atleast. Refer your “**Exploring Information Technology Concepts And Practices**” book:

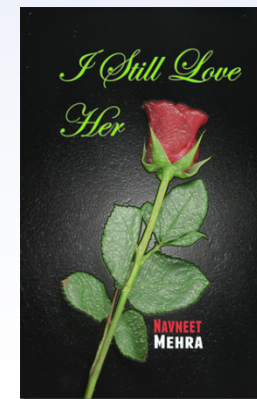
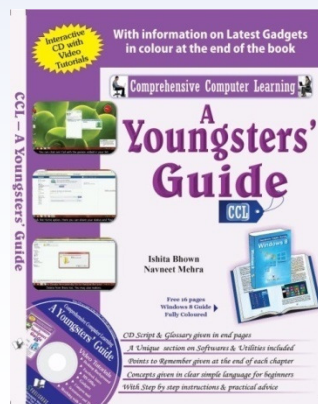
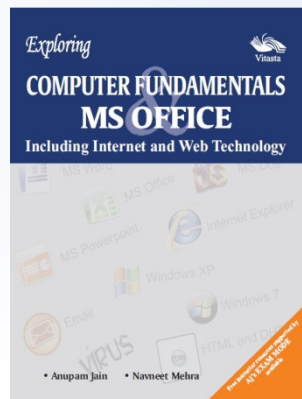
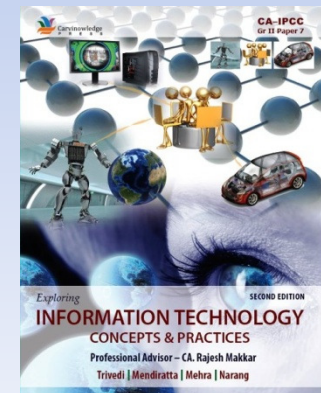
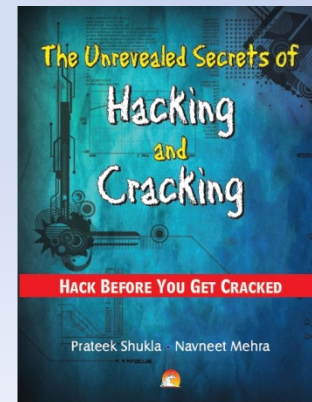
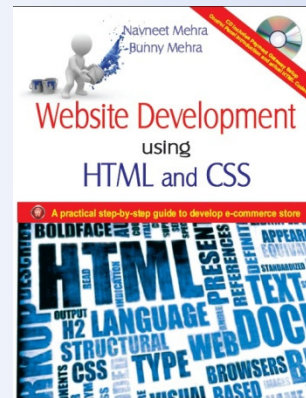
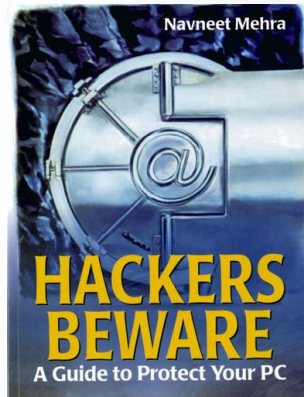
- System Software- Definition
- Different System Utilities
- Spooling, subroutine, firmware (for 1 mark question)
- Special Purpose software- payroll, inventory control(for 2 marks question) – Page No. 3.17 of the book
- Characteristics and limitations of Expert system

ALL THE BEST



My Books

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Questions ?

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