

Solution of Info Tech. – May'2011 IPCC

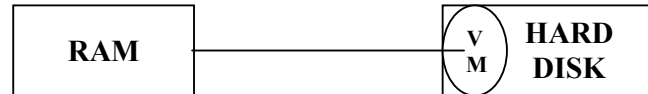
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Q. 1 Answer all the following questions in brief [5 x 2 = 10]

(a) Why a virtual memory in computer is required?

Ans. (NOTES PG. NO. 16) A programmer has to take into account the size of the memory to fit all his instructions and the data to be operated in the primary storage. If the program is large, then the programmer has to use the concept of virtual memory. Virtual memory systems extend primary memory by treating disk storage as a logical extension of RAM.

Programs stored on disk are broken up into fixed-length pages. When a program needs to be processed, the first few pages of it are brought into primary memory. Then, the computer system starts processing the program. If the computer needs a page it does not have, it brings that page in from secondary storage and overwrites it onto the memory locations occupied by a page it no longer needs. Processing continues in this manner until the program finishes. This is known as **overlaying**. Virtual memory enables computers to get by with less main memory than usual. Thus, virtual memory is primary storage that does not actually exist. It uses the hardware and software features.



(b) What is the importance of the clock speed in computers?

Ans. (NOTES PG. NO. 1) The clock speed is the speed at which the processor executes instructions. Clock speed is measured in megahertz (MHz)—which is a million cycles per second. Therefore, a 450 MHz processor performs 450 million instructions per second. Higher the clock's speed, the faster the processor, the better the system performance.

(c) What do you understand by "Message Switching"?

Ans. (NOTES PG. NO. 68) Some organizations with a heavy volume of data to transmit use a special computer for the purpose of data message switching. The computer receives all transmitted data; stores it; and, when an outgoing communication line is available, forwards it to the receiving point. This type of communication generates a hard copy. Data can transmit one way at a time (half-duplex mode of transmission). E.g. Fax machine.

(d) Explain the function of 'Arithmetic Logic Unit'.

Ans. (NOTES PG. NO. 1) The computer can perform only two types of operations: arithmetic operations and logical operations. Arithmetic operations include +, -, x, /. Logical operations include comparisons, such as determining whether one number is =, >, < another number. Some of the logical operations can be carried out on text data.

(e) Differentiate between the 'File Volatility' and the 'File Activity'.

Ans. (NOTES PG. NO. 36) **File volatility:** It refers to the number of additions and deletions to the file in a given period of time. An ISAM file would not be a good choice in situation where additions would have to be placed in the overflow area and constant reorganization of the file would have to occur. Other direct access methods would be better. Perhaps even sequential file organization would be appropriate if there were no interrogation requirements.

File activity: It is the proportion of master file records that are actually used or accessed in a given processing run. At one extreme is the real-time file where each transaction is processed immediately and hence at a time, only one master record is accessed. This situation obviously requires a direct access method. At the other extreme is a file, such as a payroll master file, where almost every record is accessed when the weekly payroll is processed. There, a sequentially ordered master file would be more efficient.

Q. 2 (a) Describe any four limitations of the computer system. [4]

Ans. (NOTES PG. NO. 1) **Limitations of Computer systems :** The computer is one of the most powerful tools ever developed.

Program must be reliable

A reliable program that's supplied with incorrect data may produce nonsense.

Application logic must be understood: The computer can only process jobs which can be expressed in a finite number of steps leading to a specific goal. Each step must be clearly defined.

No Decision making power: Computer cannot make any decisions nor can it render any help to solve a problem at its own like if we plays chess with computer, computer can take only those steps which is entered by the programmer. It cannot move at its own.

Emotionless: Computers are emotionless. They do not have emotions as human beings are having. They are simply machines which work as per the instruction given to them.

(b) What do you understand by 'data Definition Language' (DDL)? Write the various functions of the DDL. [4]

Ans. (NOTES PG. NO. 42) Defines the conceptual schema providing a link between the logical (the way the user views the data) and physical (the way in which the data is stored physically) structures of the database.

e.g. CREATE TABLE STUDENT (SNO NUMBER (3), NAME VARCHAR(25), MARKS (5,2));

this command will create a blank table in computer system as follows:

SNO	NAME	MARKS

Functions of Data Definition Language (DDL) :

(a) They define the physical characteristics of each record, field in the record, field's data type, field's length, field's logical name and also specify relationships among the records, (b) They describe the schema and subschema, (c) They indicate the keys of the record, (d) They provide means for associating related records or fields, (e) They provide for data security measures, (f) They provide for logical and physical data independence.

Q. 3 (a) Explain the significance of utility programs. List the various tasks that are performed by the utility programs. [4]

Ans. (NOTES PG. NO. 17) Utility programs are systems programs that perform general system support tasks. These programs are provided by the computer manufacturers to perform tasks that are common to all data processing installations. The following tasks are performed by the utility programs.

A wide variety of utilities are available to carry out special tasks. Three types of utility programs found in most computer systems: sort utilities, spooling software, and text editors are discussed below:

(a) Sort utilities: Sort utility programs are those that sort data.

(b) Spooling software: The purpose of spooling software is to compensate for the speed differences between the computer and its peripheral devices.

(c) Text editors: Text editors are programs that allow text in a file to be created and modified.

(d) Disk copy program - This program allows an user to copy the entire contents of one diskette to another diskette.

(e) File copy program - This program allows an user to copy just one file or a group of files, to be copied to another diskette.

(f) Disk formatting program - This program allows an user to prepare a new, blank diskette to receive data from the computer system.

(g) File deletion program - It allows an user to delete a file stored on a diskette.

(h) File viewing program - This program is used to view the contents of a file on the display screen of the microcomputer.

(i) Directory program - This program allows an user to view the names of the data and program files which are stored on a disk/diskette.

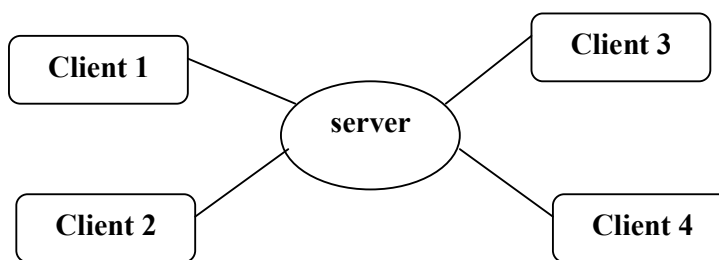
(b) Discuss the various tools that are available for the protection of information and system against compromise, intrusion or misuse. [4]

Ans. (NOTES PG. NO. 119) Several tools are now available to protect information and systems against compromise, intrusion, or misuse:

1. **Firewalls** are systems that control the flow of traffic between the Internet and the firm's internal LANs and systems. They are usually packaged as turnkey hardware/software packages, and are set up to enforce the specific security policies that are desired. A firewall is a proven, effective means of protecting the firm's internal resources from unwanted intrusion.
2. **Encryption** allows information to transit the Internet while being protected from interception by eavesdroppers. There are two basic approaches to encryption:
 - (i) *Hardware encryption* devices are available at a reasonable cost, and can support high-speed traffic.
 - (ii) *Software encryption* is typically employed in conjunction with specific applications.
3. **Message authentication** makes sure that a message is really from whom it purports to be and that it has not been tampered with. Regardless of a company's individual needs, clearly defined Internet security policies and procedures should always be part of any corporate Internet security strategy.
4. **Site Blocking** is a software-based approach that prohibits access to certain Web sites that are deemed inappropriate by management.

Q. 4 (a) – Discuss various advantages and disadvantages of star network topology. [4]

Ans. (NOTES PG. NO. 65) Star topology: The most common structure or topology known as star network is characterized by communication channels emanating from centralized control. That is, processing nodes in a star network interconnect directly with a central system. Each terminal, small computer, or large main frame can communicate only with the central site and not with other nodes in the network. If it is desired to transmit information



from one node to another, it can be done only by sending the details to the central node, which in turn sends them to the destination.

A star network is particularly appropriate for organisations that require a centralized data base or a centralized processing facility. For example, a star network may be used in banking for centralized record keeping in an on-line branch office environment.

Advantages: •It is easy to add new and remove nodes. •A node failure does not bring down the entire network •It is easier to diagnose network problems through a central hub.

Disadvantages:

•If the central hub fails, the whole network ceases to function. •It costs more to cable a star configuration than other topologies (more cable is required than for a bus or ring configuration)

(b) “Supply Chain Management should focus on certain problems.” Discuss these problems in detail. [4]

Ans. (NOTES PG. NO. 112) Problems of SCM

SCM is highly integrated process and need very effective and integrated distributions networks, some of the problems in managing SCM may be:

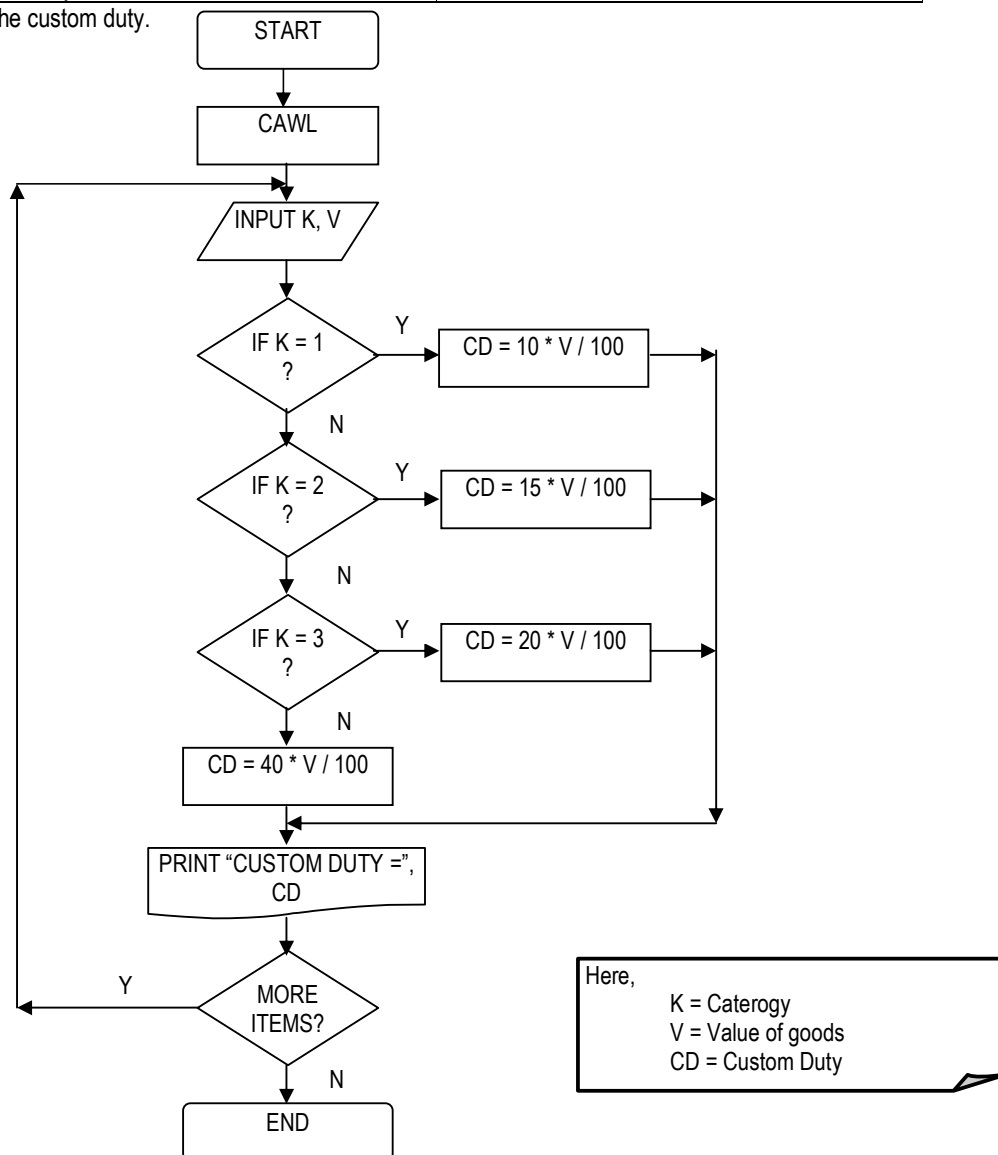
- 1.**Distribution Network Configuration:** Setting up appropriate numbers and locations of suppliers, production facilities and warehouses is big challenge.
- 2.**Distribution Strategy:** Establishing a strategy to ensure smooth flow of material and goods is another big task.
- 3.**Information Sharing:** Among various locations and setup is another issues for establishing successful SCM.
- 4.**Inventory Management:** Deciding on appropriate quantity of materials and goods to be maintained is another big stress area in SCM.

Q. 5 (a) For computing custom duty, the imported items are classified into 4 categories. The rate of duty to be levied on each category of items is given below:

Category (K)	Class of goods	% custom duty on the value of goods (V)
1	Food and beverages	10
2	Textile and leather goods	15
3	Heavy machinery	20
4	Luxury items	40

Draw a flowchart to compute the custom duty.

Ans. (SOLVED IN CLASS)



(b) Explain the necessity of the decision table. Discuss the different parts of the decision table. [4]

Ans. (NOTES PG. NO. 128) A decision table is a table which may accompany a flowchart, defining the possible contingencies that may be considered within the program and the appropriate course of action for each contingency.

Decision tables are necessitated by the fact that branches of the flowchart multiply at each diamond (comparison symbol) and may easily run into scores and even hundreds. If, therefore, the programmer attempts to draw a flowchart directly, he is liable to miss some of the branches.

A decision table is divided into four parts :

(1) Condition Stub - which comprehensively lists the comparisons or conditions. It contains the Condition Statement - Statement which introduce one or more conditions (i.e., factors to consider in making a decision). Their numberings are C1:, C2:, C3:.....

(2) Action Stub - which comprehensively lists the actions to be taken along the various program branches. It contains the Action Statements - Statements which introduce one or more actions (i.e., steps to be taken when a certain combination of conditions exist). Their numbers are A1:, A2:, A3:.....

(3) Condition entries - which list in its various columns the possible permutations of answer to the questions in the conditions stub; and that complete condition statements.

Rules - Unique combinations of conditions and actions to be taken under those conditions.

Header - Title identifying the table.

Rule Identifiers - Code (R1, R2, R3,) uniquely identifying each rule within a table.

(4) Action entries - which lists, in its columns corresponding to the condition entries the actions contingent upon the set of answers to questions of that column.

CONDITION STUB		CONDITION ENTRIES		
C1:		R1	R2	R3
C2:				
:				
ACTION STUB		ACTION ENTRIES		
A1:				
A2:				
:				

Q. 6 (a) "The efficiency and effectiveness for end use applications is limited due to some problems which are associated with File Processing System" explain these problems. [4]

Ans.- (NOTES PG. NO. 37) Management Problems of File Processing: This file processing approach is still being used, but it has several problems that limit its efficiency and effectiveness for end user applications.

1. Data Duplication: Independent data files include a lot of duplicated data; the same data (such as a customer's name and address) is recorded and stored in several files. This data redundancy causes problems when data has to be updated, since separate file maintenance programs have to be developed and coordinated to ensure that each file is properly updated. Of course, this proves difficult in practice, so a lot of inconsistency occurs among data stored in separate files.

2. Lack of Data Integration: Having data in independent files makes it difficult to provide end users with information for ad hoc requests that require accessing data stored in several different files. Special computer programs have to be written to retrieve data from each independent file. This is difficult, time consuming, and expensive for the organizations.

3. Data Dependence: In file processing systems, major components of a system i.e., the organization of files, their physical locations on storage, hardware and the application software used to access those files depend on one another in significant ways. For example, application programs typically contain references to the specific format of the data stored in the various files they use. Thus, if changes are made in the format and structure of data and records in a file, changes have to be made in all the programs that use this file. This program maintenance effort is a major burden of file processing systems. It is difficult to do it properly, and it results in a lot of inconsistency in the data files.

4. Other Problems: In file processing systems, data elements such as stock numbers and customer addresses are generally defined differently by different end users and applications. This causes serious inconsistency in the development of programs which access such data. In addition, the integrity (i.e. the accuracy and completeness) of the data is suspected because there is no control over their use and maintenance by authorized end users.

(b) How does customer Relationship management (CRM) improve customer relationship? [4]

Ans. (NOTES PG. NO.110) CRM program helps organization to improve customer relationship. Proponents say this is so because:

- Customer Details:** (a) CRM technology can track customer interests, needs, and buying habits as they progress through their file cycles, and tailor the marketing effort accordingly. (b) In this way customers get exactly what they want as they change.
- Product Details:** (a) The technology can track customer product use as the product progresses through its life cycle, and tailor the service strategy accordingly. (b) In this way consumer get what they need as the product ages.

3. **Segment of Buyers:** In industrial markets, the technology can be used to micro-segment the buying centre and help coordinate the conflicting and changing purchase criteria of its members.
4. **Technology driven improvements:** When any of the technology driven improvements in customer service contribute to long-term customer satisfaction, they can ensure: (a) Repeat purchases (b) Improve customer relationship (c) Increase customer loyalty (d) Decrease customer turnover (e) Decrease marketing costs associated with customer acquisition and customer training (f) Increase sales revenue and (g) Increase profit margins
5. **Customer satisfaction:** (a) Satisfied customer make repeated purchases (b) customer satisfaction can be achieved from a deeper understanding of each customer, their individual business challenges and proposing solutions for those challenges rather than a "one size fits all" approach.

Q. 7 Answer any four questions ; [4 x 2 = 8]

(a) What are the functions of a "Control Unit"?

Ans. (NOTES PG. NO. 1) All the computer's resources are managed from the control unit. One can think of the control unit as a traffic cop directing the flow of data. It is the logical hub of the computer. The CPU's instructions for carrying out commands are built into the control unit. The instructions, or instruction set, list all the operations that the CPU can perform. Different CPUs have different instruction sets.

(b) Explain briefly "Asynchronous Transmission".

Ans. (NOTES PG. NO. 67) Asynchronous Transmission: Each character is preceded by some information indicating the start of character transmission (the transmission start information is called a START bit usually 0) and ends by sending end-of-transmission information (called STOP bit usually 1).

(c) Write short note on 'Mobile Commerce'.

Ans. (NOTES PG. NO. 119) - MOBILE COMMERCE, or m-Commerce, is about the explosion of applications and services that are becoming accessible from Internet-enabled mobile devices. It involves new technologies, services and business models. It is quite different from traditional e-Commerce. Mobile phones or PDAs impose very different constraints than desktop computers. But they also open the door to a slew of new applications and services. M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as cellular telephone and personal digital assistants (PDAs) Known as next-generation e-commerce, m-commerce enables users to access the Internet without needing to find a place to plug in. The emerging technology behind mcommerce, which is based on the **Wireless Application Protocol (WAP)**, has made strides in countries, where mobile devices equipped with Web-ready micro-browsers are much more common.

(d) What are the advantages of using a data warehouse?

Ans. (NOTES PG. NO. 52) - Advantages of using data warehouse:

- Enhances end-user access to reports and analysis of information.
- Increases data consistency.
- Increases productivity and decreases computing costs.
- Is able to combine data from different sources, in one place. (Provides a common data model).
- It provides an infrastructure that could support changes to data and replication of the changed data back into the operational systems.

(e) How does the "Random Access Method" which is a part of the direct access file organization method perform?

Ans. (NOTES PG. NO. 36) Random Access Organization: In this method, transactions can be processed in any order and written at any location through the stored file. The desired records can be directly accessed using randomizing procedure without accessing all other records in the file.

Randomizing Procedure is characterized by the fact that records are stored in such a way that there is no relationship between the keys of the adjacent records. The technique provides for converting the record key number to a physical location represented by a disk address through a computational procedure.

X – X – X