

Unit-6

Q.1) What is filesystem?

- • The collection of related information i.e. data or programs is called as file.
- Each file has specific name, which is used to refer that file.
 - For convenient use of the computer system, OS provides a system uniform logical view of information storage.
 - The OS manages mass storage devices to implement the abstract concept of file.
 - The OS maps files on to physical devices such as tapes or disks.
 - Using various data structures, file system in Information Management allows user to define files and directories and allocate/deallocate disk space to each file.
 - There are two types of file systems:-
 - a) Taped Based System:-
 - They are simple but inefficient.
 - In these systems, files are stored on to reels of physical tapes. Generally one or more files are stored on to one tape.
 - Tapes are used for transport of data from one computer to another.
 - b) Disk-Based System:-
 - Each disk is divided into tracks and each track is divided into no. of sectors.
 - No. of tracks and size of sectors is variable. It varies from one drive to another.
 - A disk has a device directory, indicating which files are on the disk.

Q.2) What are advantages of disk-based system over tape-based system?

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- Finding a file on tape-based systems is difficult and time consuming, while a file can easily be found on a disk-based system.
 - In tape-based system, if a file is to be modified, it requires to copy entire tape whereas in disk-based system a file can be modified easily.
 - Store large information in disk-based systems as compared to TBS.
 - DBS are easier and convenient to use instead of TBS.
 - Each disk consists of no. of blocks, which can be rewritten easily; while we require entire tape to copy, if we have to rewrite something.

Q.3) What are the operations that are performed on file system?

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- What is file system definition (Q.1).

- Operations performed on file system are:-
a) create a file:- For creating a file, first whether sufficient space is available for that file is checked. If it is available, entry for new file must be made in directory.

- b) write to a file:- For writing to a file, there is a command in which name of the file is given. The OS search for that file in directory and write to it.

- c) Reading a file:- There is a system call in which the filename is specified. OS searches for file in directory and reads it.
- d) Rewind a file:- The directory is searched for appropriate entry and file is reset to beginning of file.
- e) Delete a file:- To delete a file, directory entry is searched and if file is found, it releases memory space by deleting it.

- Q.4) Define Security with respect to an OS. Explain different elements of security.
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- Security is concerned with the ^{of OS} availability to enforce control over storage and transportation of data in and between the objects, that the OS supports.
 - In multiuser system, security is very imp. as user programs should not interfere with one another.
 - There are three main elements of Security
 - a) Confidentiality.
 - b) Integrity.
 - c) Availability.
- a) Confidentiality:- It ensures that information is not accessed by unauthorized user. It is generally related to Read operations.
- b) Integrity:- It ensures that the information is not amended or deleted by an unauthorized manner. It is like write operation.

→ Availability:- It ensures that information is available to the authorized users at right time.

Q.5) What are the attacks on security? Explain short the ways in which a system can be attacked?

→ Pdf, Pg no. 28-29.

Q.6) What are Computer Worms?

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- A computer worm is a complete program by itself. It is written in such a way that it spreads to other computers over a network.
 - But, while doing this, it consumes the network resources to a very large extent.
 - A computer worm can potentially bring the entire network to a grinding halt.
 - A worm can be prevented by strong security and various check points on the communication system.

Q.7) What is Computer Virus?

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- A computer virus is a part of program, which is written with clear intention of infecting other programs.
 - A computer virus is not a complete program by itself. It cannot act independently.

- A computer virus causes direct harm to the system. It can corrupt code as well as data.
- The classification of virus is based on what it affects or where the virus resides.
- There are 5 types of viruses:-
 - a) Boot sector virus.
 - b) Memory resident virus.
 - c) File specific virus.
 - d) Command processor virus.
 - e) General purpose virus.

Q. 8) What are different methods by which virus can infect other programs?

→ a) Append:-

In this method the viral code appends itself to the unaffected programs.

b) Replace:- In this case, the viral code replaces original executable program completely or partially to carry out some funny actions.

c) Insert:- In this case, the viral code is inserted in body of executable program.

d) Delete:- In this case, the viral code deletes some code from executable programs.

e) Redirect:- In this, the normal control flow of a program is changed to execute some other code, which could exist as appended portion of normal program.

Q.9) Explain virus detection, removal and prevent.

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a) Virus Detection:-

- Normally, a virus detection program checks integrity of binary files.
- The program maintains a check sum on each file. A mismatch in it indicates virus.
- Some programs resides in memory and continuously monitor certain memory & I/O operations for guarding against any suspicious behaviour.

b) Virus removal:-

- A generalized virus removal program is very difficult to imagine due to multiplicity of viruses and creativity with which they are constructed.
- However, for some viruses, bit pattern in code can be predicted.
- In case of removal, program scans disk for patterns of known viruses. On detection, it removes it.

c) Virus prevention:-

- User cannot recover data after viral affection. Hence best way is to prevent viruses.
- For this user must buy official, legal copies of software from reliable stores or sources.
- One should be extremely careful about

picking up free, unreliable or illegal software
 - Frequent back-ups of monitoring program also help in detection and thus subsequent prevention of different viruses.

Q. 10 Differentiate between computer worms and computer virus. Explain how it can be prevented?

→ * Computer Worms:-

- i) A computer worm is a complete program.
- ii) A computer worm can act independently.
- iii) Generally it do not cause direct harm to the computer system.
- iv) It just goes on spreading on to network and consumes network resources to a large extent.

Difference

* Computer Virus:-

- i) A computer virus is not a complete program, but a part of program.
- ii) It cannot act independently.
- iii) It causes direct harm to computer system. It has been written with clear intention of infecting others.
- iv) It corrupts code and data.

* Worm Prevention:-

A worm can be prevented by a strong and various check points on communication system.

* Virus Prevention:-

- Q. 9. c)