

+1 Higher Secondary First Year Computer Science Study material

Chapter -5

OPERATING SYSTEM

2 marks and 3 marks

1. Who will access the computer hardware directly?

- ❖ Operating System will access the computer hardware directly
- ❖ The Operating system provides so many facilities with which a user comfortably uses their computers.
- ❖ The average user wants to have a simple high-level abstraction to deal with.

2. Define an OS.

- ❖ Operating System is one program running at all times on the computer.
- ❖ The Operating System is the intermediary between the user and computer hardware. (or) it is an Operating System is an interface between the user and hardware.

3. Explain the different roles taken by the OS

The desirable characters of the Operating System are

1. User Interface
2. Memory management
3. Process management
4. File management
5. Networking Capabilities management
6. Security Management
7. Fault tolerance
8. Application Base
9. Distributed Operating System

4. What is an operating System?

- ❖ The Operating System acts as the manager of resources such as CPU time, memory space, file storage, I/O devices.
- ❖ Operating System allocates resources in an optimal manner.
- ❖ It allocates resources in such a manner so as to achieve the maximum best possible result.

5. What are the goals of an Operating System?

The Operating System's goals are to:

- 1) Execute user programs in a user-friendly atmosphere.
- 2) Make the computer system convenient to use.
- 3) Optimize computer hardware.

6. What is Resident Monitor?

- ❖ In the beginning, programs were run one at a time. In order to use CPU more efficiently, jobs of similar nature were grouped and made to run in batches.
- ❖ But after program execution, the computer operator manually restarted the next program.
- ❖ To avoid the delay due to manual operation, Automatic Job Sequencing mechanism was introduced. This is called Resident Monitor.

7. What is buffer?

- ❖ A buffer was allowed to store Input, when the CPU needed the data, buffer sent the data immediately.
- ❖ The next input might be ready in the buffer before the CPU processed the earlier data.
- ❖ When the processing was completed, the CPU sent the output to the buffer.

8. What is direct memory access (DMA)?

Direct Memory Access (DMA) mechanism allows transferring data to and from memory without the intervention of the CPU.

9. What is Spooling?

- ❖ Spooling is superior to the buffer, because in spooling I/O operations can be overlapped with the working of other jobs but that is not possible with the buffer.
- ❖ While executing one job, the OS, reads next job from card reader into a storage area on the disk and outputs printout of previous job from disk to the printer.

(Or)

Spooling is superior to buffer. Spooling takes care of the printing work with the printer.

10. What is Multiple Programming?

In multiprogramming, memory is divided into many partitions. Multiprogramming allows many programmers to load their programs in the different partitions.

11. What is Data Security?

Even a single user may try to write in some sector, which may contain valuable information. In order to avoid such an awkward situation, only the Operating System is empowered to make such an allocation or de-allocation. This arrangement safeguards the loss of data. Such safeguarding of data is called Data Security.

12. What is Job Scheduling?

Spooling allowed the CPU to choose a particular job for execution leading to the concept called the Job Scheduling. The job scheduling led to the concept known as the Multiprogramming.

13. What is Time Sharing?

Multiprogramming was followed by Time-sharing concept. Here the CPU allocated a fixed time for each program.

14. What is system call?

- ❖ A set of extended instructions providing an interface between the Operating System and the user programs, is called a System Call.
- ❖ The Operating System will then generate suitable input/output command to the hardware to replace this system call.

15. Write note on User Interface.

- ❖ The Operating System should concentrate on the user interface. Similarly the only way that can interact with a computer is through the user interface.
- ❖ One can judge, from the immense popularity of the GUI (Graphical User Interface) based interface, the importance of well designed well thought interface. The GUI is window based.
- ❖ The interface should not heavily burden the memory of users. Menus, minimal typing work will be an added advantage of the Operating System.

16. Name some of the required features of Operating System.

- ❖ The Operating system should be easy to use.
- ❖ The Operating System should provide data confidentiality
- ❖ The Operating System should work in a network as well as distributed environment.
- ❖ The Operating system should provide the help facility.

17. What are the Types of OS? (3mark)

There are two types of the Operating Systems. They are

1. Single user Operating System.
2. Multi-user Operating System.

Single user Operating System: At a time, only one user can operate the system. MS Disk Operating System is an example of single user Operating System.

Multi-user Operating System: More than one user can operate the same system simultaneously. The multi-user Operating System is based on the concept of timesharing. UNIX is an example of multi-user Operating System.

18. What are the Security management levels? (3mark)

The Operating System provides three levels of securities to the user.

They are

- (1) File access level
- (2) System level
- (3) Network level

19. List out advantages of the Distributed Operating System over the Network Operating System. (3 or 5 mark)

- ❖ To make use of the Network, we must know the machine address and the variety of services provided by that machine.
- ❖ Distributed Operating System ensures that the entire network behaves as a single computer.
- ❖ Getting access to the remote resources is similar to access to local resources.
- ❖ The user's job is executed in an idle machine and the result is communicated to the user machine.
- ❖ The user is under the illusion that everything is done only in his/her computer.
- ❖ In a distributed Operating System a user is not aware of multiplicity of machines.
- ❖ The future of the Operating System may be Distributed Operating System since all the computers become a part of one or other network.

20. What is Virtual Memory?

- ❖ User memory is divided into many partitions to accommodate various jobs.
- ❖ Therefore the number of jobs accommodated cannot exceed the number of partitions.
- ❖ The size of the user program should be less than that of the available main memory.
- ❖ This is like cutting the feet to the size of the shoe (if the size of the shoe is inadequate) the Operating System provides virtual (imaginary) memory to include the entire program.

21. What is CPU Scheduling?

The allocation of processor by the process management is also known as CPU scheduling.

22. What is Fault Tolerance?

The Operating Systems should be robust. When there is a fault, the Operating System should not crash, instead the Operating System have fault tolerance capabilities.

23. What is Application Base?

Operating System should provide a solid basis for running many popular applications.

5 Mark

1. Explain the main functions of the operating system (3mark or 5mark)

- ❖ The Operating System acts as the manager of resources such as CPU time, memory space, file storage, I/O devices.
- ❖ Since there may be many conflicting requests, Operating System allocates resources in an optimal manner.

- ❖ That is, Operating System allocates resources in such a manner so as to achieve the maximum best possible result.
- ❖ The Operating System also provides the means for the proper use of hardware, software and data in the operation of the computer system.
- ❖ The Operating System is like a supervisor in a company providing an excellent environment in which the other people can perform useful work.
- ❖ Operating System assumes responsibility, serving as a control program.
- ❖ A control program controls the execution of user programs to prevent errors and improper use of the computer.
- ❖ It is especially concerned with the operation and control I/O devices.

2. Explain the process and memory managements. (5mark)

Memory Management:

- ❖ The Operating System should provide memory management techniques also. Any error in the user program should not be allowed to spoil the entire memory.
- ❖ So the Operating System divides the main memory into user memory and reserved memory.
- ❖ If some errors creep into the user program then only user memory may be affected however the reserved memory is always in an unaffected condition.
- ❖ User memory is divided into many partitions to accommodate various jobs.
- ❖ Therefore the number of jobs accommodated cannot exceed the number of partitions.
- ❖ The size of the user program should be less than that of the available main memory.
- ❖ This is like cutting the feet to the size of the shoe (if the size of the shoe is inadequate) the Operating System provides virtual (imaginary) memory to include the entire program.

Process management:

Process management undertakes the allocation of processors to one program. The Operating System controls the jobs submitted to the system (CPU). Several algorithms are used to allocate the job to the processor.

1. FIFO.
2. SJF
3. Round Robin.
4. Based on Priority.

1. FIFO.

- ❖ This algorithm is based on queuing.
- ❖ The process that enters the queue first is executed first by the CPU, then the next and then the next and so on.
- ❖ The processes are executed in the order in which they enter the queue.

2. SJF

- ❖ This algorithm is based on the size of the job.
- ❖ A byte consists of eight bits. A bit can store either TRUE (1) or FALSE (0).

3. Round Robin.

- ❖ Jobs are assigned processor time in a circular method.

For example take three jobs A, B, C.

- ❖ First the job A is assigned to CPU then job B and after B job C and then again A,B and C and so on.

4. Based on Priority.

- ❖ In this method each job is assigned a Priority. The higher Priority job is awarded favorable treatment.
- ❖ The allocation of processors by process management is also known as the CPU Scheduling.
- ❖ The objectives of the CPU Scheduling should be to maximize.
 - (1) The CPU utilization.
 - (2) The number of jobs done in a unit time (throughput) and to minimize the time taken before the execution of the job and to run the job.

3. Explain the input / output managed by operating system.

- ❖ Application software does not allocate or de-allocate the storage area on the disk for different files belonging to various users.
- ❖ If the application software is allowed to allocate or de-allocate, two or more users may try to write on the same sector of disk, resulting in confusion.
- ❖ Even a single user may try to write in some sector, which may contain valuable information.
- ❖ In order to avoid such an awkward situation, only the Operating System is empowered to make such an allocation or de-allocation.
- ❖ This arrangement safeguards the loss of data. Such safeguarding of data is called Data Security.
- ❖ Operating System alone should be empowered to instruct the hardware to write data from memory onto a Pre-specified location on the disk.
- ❖ In fact Input/Output operation code of the Operating System constitutes a sizeable code of the Operating System.
- ❖ An application program can do all the operations with the exception of input/output operations.
- ❖ When the application program is translated into the machine code, the request for reading or writing will not be translated into the machine code, instead a system call is given.
- ❖ The Operating System will then generate suitable input/output command to the hardware to replace this system call. You cannot fool the system by writing the I/O code in machine language.
- ❖ User code will not be entertained for input/output at any circumstance. This arrangement not only helps in protecting the data integrity, but also, it saves the user from writing a lot of code to execute I/O operations.
- ❖ Thus it saves from reinventing the wheel. It is enough, if the programmer concentrated in logical behaviour of the program.
- ❖ The Operating System does the spadework for the arrival of application program and the Operating System which is in the back ground, when needed comes into forefront and does its work gracefully after that it relegates itself to the background.

Chapter – 6

COMPUTER COMMUNICATION

2 mark & 3 Mark

1. What are the reasons for networking?

- ❖ Sharing of resources.
- ❖ Sharing information
- ❖ Communication.

2. Mention a few areas, where computer networks are employed

The following are the areas where computer networks are employed. ·

- ✓ Electronic data interchange ·
- ✓ Tele-conferencing
- ✓ Cellular telephone ·
- ✓ Cable Television ·
- ✓ Financial services, marketing and sales ·
- ✓ Reservation of Airlines, trains, Theatres and buses ·
- ✓ Telemedicine ·
- ✓ ATM ·
- ✓ Internet banking.

3. What are the elements that a computer communication should ensure?

The computer communication should ensure safe, secure and reliable data transfer.

- ❖ **Safe** : The data received is the same as the data sent
- ❖ **Secure** : The data being transferred cannot be damaged either will fully or accidentally.
- ❖ **Reliable**: Both the sender and the receiver knows the status of the data sent.
Thus the sender knows whether the receiver got the correct data or not.

4. What are the Benefits of Network?

Benefits of Network

- ❖ Effective handling of personal communications ·
- ❖ Allowing several users to access simultaneously Important programs and data
- ❖ Making it easy for the users to keep all critical data on shared storage device and safeguard the data. Allowing people to share costly equipment.

4. List the general types of networks used today.

The following are the general types of networks used today.

- ❖ Local Area Network (LAN)
- ❖ Metropolitan Area Network (MAN)

- ❖ Wide Area Network (WAN)

5. Explain WAN.

A WAN is typically two or more LANs connected together across a wide geographical area. The individual LANs separated by large distances may be connected by dedicated links, fiber optic cables or satellite links

6. How data is transmitted in different forms?

Data is transmitted in two forms

1. Analog data transmission : Analog data transmission is the transmission of data in a continuous waveform.

2. Digital data transmission: Digital data transmission is the widely used communication system in the world. The distinct electrical state of 'on' and 'off' is represented by 1 and 0 respectively.

7. What are the transmission modes?

When two computers are in communication, data transmission may occur in one of the three modes.

- 1 Simplex mode .
- 2 Half duplex mode
- 3.Full duplex mode

8. What is TCP?

- ❖ TCP stands for **transmission control protocol** and IP stands for Internet Protocol.
- ❖ TCP breaks up the data to be sent into little packets. It guarantees that any data sent to the destination computer reaches intact.

9. What is the role of ICANN?

- ❖ The Internet as a whole does not have a single controller.
- ❖ The Internet society, which is a voluntary membership organization, takes the responsibility to promote global information exchange through the Internet technology.
- ❖ **Internet Corporation for Assigned Names and Numbers (ICANN)** administers the domain name registration. It helps to avoid a name which is already registered.

10. Explain URL.

Every web page has a unique address called the **Uniform Resource Locator or URL**. The URL locates the pages on the Internet. An example of URL is

<http://www.textbooksonline.tn.nic.in/std11.html>

11. What are the types of topology?

There are five types of topology:

1. Star network 2. Ring network 3. Bus network 4. Hybrid network 5. FDDI network.

12. What is NODE? (Or) What is topology?

The network topology is the structure or layout of the communication channels that **connects the various computers on the network**. Each computer in the network is called a node.

13. What is Network?

- ❖ A large number of computers are interconnected by copper wire, fiber optic cable, microwave and infrared or through satellite.
- ❖ A system consisting of connected nodes made to share data, hardware and software is called a Computer Network.

14. What is NIC?

The device that coordinates the data transfer is called **Network interface card (NIC)**. NIC is fixed in the computer and communication channel is connected to it. Ethernet, Arcnet and token ring are the examples for the NIC.

15. Define MODEM?

The device that accomplishes **modulation – demodulation** process is called a modem.

- ❖ The process of converting Sound or Data into a signal that can flow through the telephone wire is called **Modulation**.
- ❖ The process of converting signal that can flow through the telephone wire into Sound or Data is called **DeModulation**.

16. What is internet?

Several networks, small and big all over the world, are connected together to form a Global network called the Internet.

17. What are the Common Network services?

The following common network services are available.

- ❖ File Services
- ❖ Print services
- ❖ Message services
- ❖ Application Services.

18. Define FDDI Network.

A FDDI network (**Fiber Distributed Data Interface**) is a high-speed network using fiber optic cable. It is used for high tech purposes such as electronic images, high-resolution graphics and digital video. The main disadvantage is its high cost.

19. What is telnet?

Telnet: Telnet is a protocol that allows the user to connect to a remote computer. This feature is used to communicate a microcomputer with mainframe.

20. What is UTP?

UTP stands for **Unshielded Twisted Pair**. **UTP** cables are used as communication channels in network

- ❖ In a star network all computers and other communication devices are connected to a central hub.
- ❖ Such as a file server or host computer usually by a Unshielded Twisted Pair (UTP) cables.

21. Give any four names of internet browsers?

Internet explorer, Netscape navigator ,Google chrome, mozilla firefox.

22. Give any four names of search engines .

Some of the popular Search engines are Yahoo, Lycos, AltaVista, Hotbot , Google and Askjeeves

23. Define FTP.

FTP: File Transfer Protocol, abbreviated as FTP is used for the net user for transferring files around the world. The transfer includes software, games, photos, maps, music and such other relevant materials.

24. List out the things we need for internet connection?

To use an Internet in the simplest way, we need

- ❖ A Computer .
- ❖ A Telephone line.
- ❖ A Modem,
- ❖ Internet Service Provided or ISP

25. What is Transmission media?

Transmission media Transmission media is the pathway for contacting each computer with other. Transmission media include cables and wireless Technologies that allows networked devices to contact each other. This provides a message delivery path.

26. What is protocol?

Protocols A protocol can be one rule or a set of rules and standards that allow different devices to hold conversations.

27. What is Data Transmission Rate?

Data Transmission Rate the speed at which data travel over a communication channel is called the communication rate. The rate at which the data are transferred is expressed in terms of bits per second (bps).

28. What is intranet?

Many organizations have Local Area Network that allows their computers to share files, data, printers and other resources. Sometimes these private network uses TCP / IP and other Internet standard protocols and hence they are called intranet.

29. What is Extranet?

Intranet connecting selected customers, suppliers and offices in addition to the internal personnel, is called extranet

5 Marks

1. Explain the common types of networks.

The following are the general types of networks used today.

- Local Area Network (LAN)
- Metropolitan Area Network (MAN)
- Wide Area Network (WAN)

LAN:

- ❖ A network connecting systems and devices inside a single building or buildings close to each other is called Local Area Network (LAN) .
- ❖ Generally LANs do not use the telephone network.
- ❖ They are connected either by wire or wireless. Wired connection may be using twisted pairs, coaxial cables or Fiber Optic cables.
- ❖ In a wireless LAN, connections may be using infrared or radio waves.
- ❖ Wireless networks are useful when computers are portable. However, wireless network communicates slowly than a wired network.
- ❖ The number of Computers in the network is between two to several hundreds. LAN is generally used to share hardware, software and data. A computer sharing software package and hard disk is called a file server or network server.

MAN:

A Network that spans a geographical area covering a Metropolitan city is called Metropolitan Area Network (MAN).

WAN :

A WAN is typically two or more LANs connected together across a wide geographical area. The individual LANs separated by large distances may be connected by dedicated links, fiber optic cables or satellite links.

2. Explain the network topology .

The network topology is the structure or layout of the communication channels that connects the various computers on the network. Each computer in the network is called a node.

Star Network :

In a star network all computers and other communication devices are connected to a central hub. Such as a file server or host computer usually by a Unshielded Twisted Pair (UTP) cables.

Ring Network:

- ❖ In a ring network computers and other communication devices are connected in a continuous loop .
- ❖ Electronic data are passed around the ring in one direction, with each node serving as a repeater until it reaches the right destination.
- ❖ There is no central host computer or server.

Bus Network:

In a bus network all communication devices are connected to a common cable called bus (Fig. 6.4). There is no central computer or server. The data transmission is bidirectional.

Hybrid Network:

A hybrid network is a combination of the above three networks suited

to the need.

FDDI Network:

- ❖ A FDDI network (pronounced as fiddy short for Fiber Distributed Data
- ❖ Interface) is a high-speed network using fiber optic cable.
- ❖ It is used for high tech purposes such as electronic images, high-resolution graphics and digital video.
- ❖ The main disadvantage is its high cost.

3. Advantages of Print services.

Network application that control manage access to printers and fax equipments.

The print service function includes

- ❖ **Provide multiple access (more than one user, use the network)** – reduce the number of printers required for the organization.
- ❖ **Eliminates distance constraints** – take a printout at a different location.
- ❖ **Handle simultaneous requests** – queue print jobs reducing the computer time.
- ❖ **Share specialized equipments**-Some printers are designed for specific use such as high-speed output, large size formals or colour prints. Specialised equipments may be costlier or may not be frequently used by the user, when numerous clients are using the network, printer use is optimized.
- ❖ **Network fax service** – Fax service is integrated in the network. The computer in the network sends the digital document image to any location. This reduces the time and paper handling.

4. Explain the File Services in Network.

Those are the primary services offered by the computer networks. This improves the efficient storage and retrieval of computer data. The service function includes.

File transfer –Rapidly move files from place to place regardless of file size, distance and Local operating system.

• **File storage and data migration** – Increasing amount of Computer data has caused the development of several storage devices.

- Network applications are well suited to control data storage activity on different storage systems. Some data becomes less used after certain time. For example higher secondary examination result posted on the web becomes less used after a week.
- Such data can be moved from one storage media (say hard disc of the computer) to another, less expensive media (say an optical disk) is called data migration.

• **File update synchronization** – Network service keeps track of date and time of intermediate changes of a specific file.

- Using this information, it automatically updates all file locations with the latest version.

• **File archiving** – All organizations create duplicate copies of critical data and files in the storage device.

- This practice is called file archiving or file backup. In case of original file getting damaged, Computer Operator uses the Network to retrieve the duplicate file.
- File archiving becomes easier and safe when storage devices are connected in the Network.

5. Explain the functions of Modem.

Computers at different parts of the world are connected by telephone lines. The telephone converts the voice at one end into an electric signal that can flow through a telephone cable.

- ❖ The telephone at the receiving end converts this electric signal into voice. Hence the receiver could hear the voice. The process of converting sound or data into a signal that can flow through the telephone wire is called modulation.
- ❖ The reverse process is called demodulation.
- ❖ The telephone instrument contains the necessary circuit to perform these activities.
- ❖ The device that accomplishes modulation – demodulation process is called a modem. It is known that the electrical and sound signals are analog - which continuously vary with time.
- ❖ Equipments (DTE) are connected through modem and Telephone line. The modems are the Data Circuit Terminating Equipments (DCE).
- ❖ DTE creates a digital signal and modulates using the modem. Then the signals relayed through an interface.
- ❖ The second modem at the receiving end demodulates into a form that the computer can accept.
- ❖ A modem that has extra functions such as automatic answering and dialing is called intelligent Modems.

6. Explain the Transmission Mode.

When two computers are in communication, data transmission may occur in one of the three modes.

1. **Simplex mode**
2. **Half duplex mode.**
3. **Full duplex mode.**

Simplex mode

❖ In simplex mode, data can be transmitted in one direction as shown in the figure. The device using the simplex mode of transmission can either send or receive data, but it cannot do both.

- ❖ An example is the traditional television broadcast, in which the signal is sent from the transmitter to the TV. There is no return signal. In other words a TV cannot send a signal to the transmitter.

Half duplex mode

❖ In Half duplex mode data can be transmitted back and forth between two stations. But at any point of time data can go in any one direction only.

- ❖ This arrangement resembles traffic on a onelane bridge.
- ❖ When traffic moves in one direction, traffic on the opposite direction is to wait and take their turn.
- ❖ The common example is the walkytalky, wherein one waits for his turn while the other talks.

Full duplex mode

- ❖ In full duplex mode a device can simultaneously send or receive data.
- ❖ This arrangement resembles traffic on a two-way bridge, traffic moving on both directions simultaneously.
- ❖ An example is two people on the telephone talking and listening simultaneously.
- ❖ Communication in full duplex mode is faster.
- ❖ Full duplex transmission is used in large computer systems. Products like “Microsoft Net Meeting’ supports such two way interaction

ALL THE BEST

Thanks and Regards



*D.Easwaran. M.sc B.ed .
Computer instructor.
Ramjajayam Vidya mandir Matric Hr Sec School. Cumbum.
Theni District. Cell: 8760324704.*

WWW.Padasalai.Net