

I'd 16463 name sami ul haq

Course: Computer applications/Skills/ITC/CAB **Program:** BS

Semester: 4th

Major Assignment

Total Marks: 50

Instructor: Zakir Rahim

Due Date: 25th Sep,2020

Instructions:

- Students are required to solve the provided assignment and upload it on SIC in due time.
 - The solutions can be type-written or hand-written.
 - In case of handwritten solutions, you are required to copy pictures of the solved assignment in Ms-Word and upload it.
 - The solutions must be uploaded either in Ms-Word format or pdf format.
 - Students are required to save the file with their name and student id. For example ahmad_12345.
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Q1. (a) Differentiate between open source software and applications software?

Ans 1 : (a)

Open Source Software:

A software for which the original source code is made freely available and may be redistributed and modified according to the requirement of the user.

The term open source refers to something people can modify and share because its design is publicly accessible.

Open source software is software with source code that anyone can inspect, modify, and enhance.

"Source code" is the part of software that most computer users don't ever see; it's the code computer programmers can manipulate to change how a piece of software a "program" or "application" works. Programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly.

Example:

The Linux kernel is a prominent example of free and open source software. It is a Unix-like operating system released under the GNU General Public License

version (GPLv2)

Application Software:

It is a type of software which is used for a particular (specific) task.

Application software cannot run on itself but is dependent on system software to execute.

When you open an application, it runs inside the operating system until you close it.

Application software is a program or group of programs designed for end users.

Application Software are also known as Packages that help the user to get his required output.

Example:

Microsoft Word for Documentation

Excel for Accounting

PowerPoint for Presentation

Access for Database

Types of Application S/w:

i) General-Purpose s/w ii) Special purpose s/w

i) General Purpose s/w:

General-purpose software refers to computer applications that are not designed for a particular business, industry or department.

General-purpose software is designed for the general use of ordinary computer users. This type software's are popular and is most commonly used in schools, colleges, hospitals, businesses, industries and other commercial centers.

Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Access and Microsoft Outlook are examples of general purpose software.

One of the biggest advantages of this type of software is that, unlike specialized software, it is cheap and easily available from most local computer software shops. The fact that the software has been used for a long time means developers update it from time to time. For example, modern data processors are more improved than those used a decade ago. Another benefit is that general purpose software comes with support for the user in terms of guides, books, online help and user discussion platforms on the

Internet.

ii) Special Purpose s/w:

Special purpose application software is a type of software created to execute one specific task.

For example a camera application on your phone will only allow you to take and share pictures. Another example would be a chess game, it would only allow you to play chess.

Other examples of special purpose application software are web browsers, ATM, calculators, media players, calendar programs etc.

Other example of application software are: shareware, freeware, interprize software, media software, simulation software etc. (6)

(b) Write different features of system software?

Ans 1 (b)

System Software:

System software is a type of computer program that is designed to control and work with a computer's hardware and application programs.

If we think of the computer system as a layered model, the system software is the interface between the hardware and user applications.

Features of System Software:

An important feature of System Software are:

- System Software is closer to the system
- Generally written in a low-level language
- The system software is difficult to design and understand
- Fast in speed
- Less interactive
- Smaller in size
- Hard to manipulate

Types of System Software:

The two main types of system software are the operating system and the software installed with the operating system, often called utility software.

Other types Device Drivers and Firmware.

i) Operating System:

Operating System (OS) is the most important kind of system software and can be defined as a set of programs which coordinate and control computer operation.

OS manage all of the resources of the computer system.

It play a role of bridge between a user and hardware, means provide interface b/w user & Hardware.

Every general-purpose computer must have an operating system to run other programs and applications.

It operate the computer system

An operating system (OS) is the program that, after being initially loaded into the computer by a boot program, manages all the other programs in a computer.

Simply we can say that, an operating system (OS) is system software that manages computer hardware and software.

Function of OS:

An operating system has three main functions:

- (1) Manage the computer's resources, such as the central processing unit, memory, disk drives, and printers,
- (2) Establish a user interface.
- (3) Execute and provide services for applications software.

Main functions of OS are Job control, Memory Management, Keep track of computer resources, Produce error messages, Multiprogramming, Supervisor.

Types of OS:

Microsoft Windows, Mac OS, and Linux are three well-known examples of this type of system.

Multi-user operating systems allow multiple users to simultaneously use the resources on a single computer. UNIX is an example of a multi-user operating system.

Microsoft Windows (7, 8, 8.1, 10 etc) provide GUI (Graphical User Interface),

while Linux provide command line interface.

ii) Firmware:

- It is permanent software programmed into a read-only memory.
- Firmware is held in non-volatile memory devices such as ROM, EPROM, or flash memory. Changing the firmware of a device may rarely or never be done during its lifetime; some firmware memory devices are permanently installed and cannot be changed after manufacture.
- Firmware is a software program or set of instructions programmed on a hardware device. It provides the necessary instructions for how the device communicates with the other computer hardware.

iii) Utility Software: Utility software is system software designed to help analyze, configure, optimize or maintain a computer.

iv) Device Drivers:

- A device driver is a program that controls a particular type of device that is attached to your computer. There are device drivers for printers, displays, CD-ROM readers, diskette drives, and so on. When you buy an operating system, many device drivers are built into the product. (6)

Q2. (a) Discuss different functions of operating system?

(6)

Ans 2 (a)

Function of Operating system:

An operating system has three main functions:

- (1) Manage the computer's resources, such as the central processing unit, memory, disk drives, and printers,
- (2) Establish a user interface.
- (3) Execute and provide services for applications software.

Other functions of Operating system are Job control, Memory Management, Keep track of computer resources, Produce error messages, Multiprogramming, Supervisor.

(b) Explain the use of File Transfer Protocol and TelNet services ?
(8)

Ans 2 (b)

Use of File Transfer Protocol:

File Transfer Protocol is a standard network protocol used for the transfer of computer files between a client and a server across a computer network. FTP can be used through a command-line interface such as DOS in Windows and Terminal in Linux & MacOS.

The FTP functions give client access to file servers through the File Transfer Protocol (FTP).

The FTP functions are used to open, login and close connections, as well as upload, download, rename, delete, and get information on files from file servers.

Telnet Server:

Telnet Server allows command line access to an embedded module over an IP network.

Telnet is a simple, text-based network protocol that is used for accessing remote computers over TCP/IP networks like the Internet

Telnet is a protocol used on a network to provide a two-way interactive command line interface (CLI) using a virtual terminal connection. User data and Telnet control information is transferred on a data connection using TCP.

Q3. (a) Explain Metropolitan Area Network (MAN) with a suitable example?

Ans 3: (a)

MAN:

- MAN is an abbreviated of metropolitan Area Network.
- MAN is a network that is spread over an entire big city or more than one city.
- It is larger than LAN but smaller than WAN.
- It is established inside the big city or more than one city.
- An example of MAN may be networks established inside different cities of KPK are then connected to a single network then this single network is called Metropolitan Area Network.

- MAN enlarges to become a nationwide network.
- It uses high speed fiber optics lines to connect computer located at various places at city.
- NADRA is best example of MAN

Aa(7)

(b) Define topology? Which topology would you chose to setup a local area network and why?

(7) Ans 3 (b)

Topology:

- The physical layout of a network is called Network topology.
- OR the wiring scheme of a local area network is called topologies.
- Physical layout means the way in which different computers and other equipment's are connected with each other.
- The term topology, or more specifically, network topology, refers to the arrangement or physical layout of computers, cables and other components on the network.
- The two simplest are point-to-point lines and multi drop lines.

Point-to-Point:

- Point-to-point lines are used, when each terminal is connected by its own line to a computer system.
- Point to point also called line network or linear network
- IEEE-488 is an example of a network that may be connected in a linear fashion; however GPIB uses the term Daisy Chained.

Multidrop:

- Multidrop lines are used, when several terminals share each data communications line to a computer.

- Point-to-point lines are more expensive than multidrop lines:
- All of the communication capacity and equipment of a communications line is being used by a single terminal. Therefore, point-to-point are used only if there will be continuous communications between a computer a terminal or other computer system.
- A multidrop line decreases communication costs, because each line is shared by many terminals.
- Communications processor such as multiplexers and concentrators help many terminals share the same line.
- A Multi-Drop Network is a specific type of Bus Network Topology.

For Local area network I will choose Star topology because we know that Local area network is bounded in a building, office or campus so star topology will fit best due to its advantages.

STAR Topology:-

- A star topology is designed with each node (like workstations, printers, laptops, servers etc.) connected directly to a central device called Hub or switch
- Each workstation has a cable that goes from its network card to a network switch
- The Connection between Computers and central hub is visually represented in a form similar to a star
- Star topology is also known as a star network
- It is client-server topology. There is a central Hub, which connects each client to the server with the help of cables. The server then handles the signals as they are received from clients. These clients are also called nodes or devices.
- Its shape just like star, that's why called star topology.

This topology has following advantages:

- The failure of one cable doesn't affect the other stations
- Even in case of heavily used the performance of network is consistent
- Each station is attached to hub with separate cable so data signals never collide

- Network is not disrupted by addition of new stations
- Hub can accommodate multiple cable type
- Finding fault becomes very simple.

Q4. In your opinion, what are the different types of common media used for storage, access and transmission of information? Explain each type in detail?
(10)

Ans 4)

In My Opinion Common Media for storage are:

Hard disk:

A hard drive is the hardware component that stores all of your digital content. Your documents, pictures, music, videos, programs, application preferences, and operating system represent digital content stored on a hard drive. Hard drives can be external or internal.

Flash Memory:

Flash memory is used in enterprise data center server, storage and networking technology, as well as in a wide range of consumer devices, including USB flash drives -- also known as memory sticks , SD cards, mobile phones, digital cameras, tablet computers and PC cards in notebook computers and embedded controllers.

CD:

Stands for "Compact Disc." CDs are circular discs that are 4.75 in (12 cm) in diameter. The CD standard was proposed by Sony and Philips in 1980 and the technology was introduced to the U.S. market in 1983. CDs can hold up to 700 MB of data or 80 minutes of audio. The data on a CD is stored as small notches on the disc and is read by a laser from an optical drive. The drives translate the notches (which represent 1's and 0's) into usable data.

Four main media access control methods are used in networking:

- Carrier Sense Multiple Access with Collision Detection (CSMA/CD), which is used in Ethernet networking

- Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA), which is used in AppleTalk networking
- Token passing, which is used in Token Ring and Fiber Distributed Data Interface (FDDI) networking
- Demand priority, which is used in 100BaseVG networking

Transmission media

- Transmission media/Telecommunication Media/channels (also called communication lines or links) is the path that connects sender and receiver to transfer data between sending and receiving devices in a telecommunication network
- Transmission media is used to transmit data across the network
- Transmission media is composed of communication channels that are links between computers and are followed by the data signals
- There are two broad categories of communication or transmission media.
 - 1) Cabling system (Guided Media)
 - 2) Wireless (Unguided Media).

1) Cabling system (Guided Media) bounded media

In Guided media, different types of cables are used as a communication channel. These cables play an important role in network.

- 1) Speed
- 2) Performance
- 3) Cost
- 4) Practicality

Cabling System Includes:

1) Twisted Pair Cable:

- Twisted pair wire consists of two strands of insulated copper wire, twisted around each other in pair that's why called twisted pair cable.
- The copper wire is covered with aluminum or polyester shield. The copper wire is used to provide communication channels. Copper is used to transmit the data in the form of pulses of electric current

- An example of this may be the telephone Wire.
- Twisted pair cabling is the same type of cabling system used for home and office telephone system and Local Area Network.

Advantages of Twisted Pair Cable

1. It is inexpensive and easy to install
2. UTP (Unshielded Twisted Pair Cable) is low in cost than STP and other types of cables
3. The bandwidth capacity of STP is 16Mbps-500Mbps (Mega bytes per second)
4. The bandwidth capacity of UTP is 1-155Mbps
5. The node Capacity of both STP and UTP is 2 (Two) computers.
6. Attenuation is 100 meters in both UTP and STP cables.

Disadvantages of Twisted Pair Cable

- It creates noise and its transmission is easily interrupted by magnetic.
- STP and UTP both are susceptible to EMI (Electro magnetic Interface).
- However STP is less susceptible to EMI than UTP.

It has two types.

- i) Shielded Twisted Pair
- ii) Unshielded Twisted Pair

i) UTP

UTP stands for unshielded twisted pair, a popular type of cable that consists of two unshielded wires twisted around each other. Due to its low cost, UTP cabling is used extensively for local area networks (LANs) and telephone connections. UTP cabling does not offer as high bandwidth or as good protection from interference as coaxial or fiber optic cables, but it is less expensive and easier to work with.

ii) STP:

STP stands for Shielded twisted pair, a type of copper telephone wiring in which each of the two copper wires are twisted together and are coated with an insulating coating that functions as a ground for the wires. The extra covering is shielded twisted pair wiring protects the transmission line from electromagnetic interference leaking into or out of the cable. STP cabling often is used in Ethernet

networks, especially fast data rate Ethernets.

Advantages:

- It is then, flexible cable that is easy to string between walls.
- More lines can be run through the same wiring ducts.
- Electrical noise going into or coming from the cable can be prevented.

Disadvantages:

- Twisted pair's susceptibility to electromagnetic interference greatly depends on the pair twisting schemes (usually patented by the manufacturers) staying intact during the installation. As a result, twisted pair cables usually have stringent requirements for maximum pulling tension as well as minimum bend radius.
- In video applications that send information across multiple parallel signal wires, twisted pair cabling can introduce signaling delays known as skew which cause subtle color defects and ghosting due to the image components not aligning correctly when recombined in the display device.
- STP is expensive than UTP.

2) Coaxial Cables:

- Coaxial cable is a copper cable used by cable TV companies, telephone companies and for Local Area Network (LAN).
- It is called "Coaxial" because it is a two conductor cable in which one conductor forms an electromagnetic shield around the other.
- The two conductors are separated by insulation.
- They can transmit data much faster and more accurately than twisted pair cables.

There are two types of coaxial cables.

1. Base band Coaxial Cable
2. Broad band coaxial cable

i) Base band Coaxial Cable:

It carries one signal at a time. A bit of 0 or 1 value is sent by the presence or absence of voltage in the cable. Base band signals can travel very fast but can only be sent over short distances. Over about 1000 feet, special booster equipments are needed for base band coaxial cables.

ii) Broad band Coaxial Cable:

It can carry multiple signals on a fixed carrier wave, with the signals 0s and 1s sent as variations on this wave. Data, Audio, and Video transmission can take place simultaneously using broadband coaxial cables.

Advantages of Coaxial Cables

- >The installation is simple.
- >The extra insulation makes coaxial cable much better resisting noise than twisted pair wiring.
- >It transmits data much faster than twisted pair.
- >It has higher potential of bandwidth capacity.
- >The node capacity of thick coaxial cable is 100 computers.
- >While thin coaxial cable is 30 computers.
- >Attenuation is 185 and 500 meters for thin and thick coaxial cables.
- >These cables offer much better resistance to EMI.

Disadvantages:

- >It is expensive than twisted pair cable.
- >The thicker the cable, the more difficult to work with.

Coax interfaces include: BNC, SMA, TNC, Type F, RCA, SMB, MCX, MC-Card, Type-N, and more. We carry coax RF connectors and tools such as cable strippers, coaxial crimp tools, compression tools, and pin crimp tools to accommodate all of your coaxial termination requirements.

3) Fiber Optic Cables:

- >These cables are made of very thin glass or plastic fibers that use light pulses to transmit data instead of electricity.
- > These cables have greatest bandwidth and can carry several thousand voice communication simultaneously.
- >A single fiber optic cable may contain thousands of fibers and it has a shield which protects the signals from external prismatic effects or any possible dispersion in the form of rainbow when the weather is rainy.
- >It is latest technology according to a research if half population of the world is on one side of a single fiber optics cable and the other half on the other side of the same fiber optics cable, then they can communicate with each other if proper multiplexing technique are used.

Uses:

Fibre optic cable is widely used for larger LAN installations where cable runs exceed 100 meters or so, where copper cable would struggle with weakening signals. It is also widely used where extreme bandwidth is required for example cable television and high speed internet access.

Advantages of Fiber Optic Cables

- o Fiber optic cables can carry more data than metal cables.
- o These are less susceptible to interference than metal cable.
- o These are much thinner and lighter than metal wires.
- o Data transmission is digital and analog.
- o These cables have high bandwidth capacity, which ranges from 100 Mbps to 10 Gbps.
- o System performance.
- o Immunity to electrical noise.
- o These have lower attenuation and therefore transmit signals up to kilometers.
- o Fiber optic is not subject to EMI.
- o Overall system economy
- o Latest technology

- o Can carry signals over a much longer distance without a repeater compared to copper. The more repeaters used the more expensive it is to set up.
- o Immune to corrosion
- o Excellent security as it is difficult to tap into a glass fiber without detection
- o One cable carries many fibers, each fiber can carry 10Gbps or more

Disadvantages of Fiber Optic Cables

- o Chromatic dispersion of light may occur due to the prismatic effects.
- o Fiber optic components are expensive.
- o Installation of fiber optic is difficult.
- o They are more fragile than wire and are difficult to split.
- o The lack of standardization in the industry has also limited the acceptance of fiber optics.
- o The complex electronics at both ends of the line tends to be more expensive

2) Wireless (Unguided Media) unbounded

Wireless or Unguided media is used to communicate across long distances without using cable as a media. This communication takes place through waves. Wireless media includes:

1) Satellite Transmission: or Communications satellites:

Communication satellite is a space station. It receive microwave signal from earth station. It amplifies the signal the signal and retransmits them back to earth.

Satellite Transmission using satellite-dish and communication satellite. It is possible to send the signals over very long distances. Communication satellites are placed about 23,300 miles above the earth in Geo-Synchronous orbit. These satellites continuously rotate with the earth and transmit signals from one location to another.

The data transfer speed of communication satellite is very high. The transmission from earth station to satellite is called uplink. The transmission from satellite to

earth station is called downlink. There is no insight path problem.

2) Microwaves Transmission:

It is that type of transmission that takes place through microwaves. It was first used to transmit across long distances that were difficult to wire. These waves move in straight line and its transmission distance is about 49km (30 miles). Special microwave stations are needed to transmit data between two points. These microwave stations are usually located at the hilltops or towers. Microwave antennas are usually placed on top of building, towers, hills, and mountain peaks. They are still a popular medium, for both long-distance and metropolitan area networks. There is no cable involve.

3) Mobile Communication:

Communication through mobile sets is called mobile communication. Two main advantages of mobile communications are mobility and wireless. Now a day mobiles are used for many purposes such as sending pictures, video, mobile e-commerce etc. Mobile phone use a combination of radio wave transmission and conventional telephone circuit switching, through packet switching is already in use for services such as internet access and WAP.

4) Cellular Radio:

Cellular Radio is the use of Technology using low powered radio transmission for transmission and receiving voice or data to a telephone network. Users can be stationary or mobile. It means users are no longer constrained to place as it is a "wireless" system.

Cellular radio has become an important communications medium for mobile voice and data communications. The integration of cellular and other mobile radio technology is expected to accelerate in the next few years.

Personal Communications Service (PCS) is set of technologies used for digital cellular devices. Handheld computer, cellular telephones, and fax machine use PCS.