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**EXAMINATION: FINAL TERM**



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**Question 1:**

Part (a):

**What is System Software?**

System Software is a set of programs that control and manage the operations of computer hardware. It also facilitates application programs to execute correctly.

System Software are designed to govern the operation and extend the processing functionalities of a computer system. System software makes the operation of a computer more fast, effective, and secure. Example: Operating system, programming

**What is an Application Software?**

Application Software is a program that does real work for the user. It is mostly created to perform a specific task for a user.

Application Software acts as a mediator between the end-user and System Software. It is also known as an application package. This type of software is written using a high-level language like C, Java, VB. Net, etc. It is a user-specific and is designed to meet the requirements of the user.

You can also install multiple Application Software on a single System Software. You can store this kind of software on CDs, DVDs, flash derive, or keychain storage devices. Example: Word-processing, Spreadsheet, Database, etc.

**Differences:**

* System software are designed to manage the resources of the system, like memory and process management, security, etc. whereas Application software are designed to fulfil the requirements of the user for performing specific tasks.
* The System Software is a general-purpose software while the Application Software is specific purpose software.
* System Software is written in a low-level language like a machine or assembly language but Application software is a high-level language is used to write Application Software.
* System Software is capable of running independently while Application software can't run independently.
* The System Software starts running when the system is powered on and runs until the system is powered off while the Application Software starts when the user begins, and it ends when the user stops it.
* System software are independent of the application software while an Application software needs system software to run.

**Part (b):**

**Features of System Software**

An important feature of System Software are:

* Fast in speed
* Less interactive
* Smaller in size
* Hard to manipulate
* System Software is closer to the system
* The system software is difficult to design and understand
* It is written in the low-level language, or you can say that it is written in machine language which is only understood by the machine.

**Question 2:**

Part (a):

Discuss different functions of operating system?

1. **Security –**  
   The operating system uses password protection to protect user data and similar other techniques. it also prevents unauthorized access to programs and user data.
2. **Control over system performance –**  
   Monitors overall system health to help improve performance. Records the response time between service requests and system response to have a complete view of the system health. This can help improve performance by providing important information needed to troubleshoot problems.
3. **Job accounting –**  
   Operating system Keeps track of time and resources used by various tasks and users, this information can be used to track resource usage for a particular user or group of user.
4. **Error detecting aids –**  
   Operating system constantly monitors the system to detect errors and avoid the malfunctioning of computer system.
5. **Coordination between other software and users –**  
   Operating systems also coordinate and assign interpreters, compilers, assemblers and other software to the various users of the computer systems.
6. **Memory Management –**  
   The operating system manages the Primary Memory or Main Memory. Main memory is made up of a large array of bytes or words where each byte or word is assigned a certain address. Main memory is a fast storage and it can be accessed directly by the CPU. For a program to be executed, it should be first loaded in the main memory.

An Operating System performs the following activities for memory management:

It keeps tracks of primary memory, i.e., which bytes of memory are used by which user program. The memory addresses that have already been allocated and the memory addresses of the memory that has not yet been used. In multi programming, the OS decides the order in which process are granted access to memory, and for how long. It allocates the memory to a process when the process requests it and deallocates the memory when the process has terminated or is performing an I/O operation.

1. **Processor Management –**  
   In a multi programming environment, the OS decides the order in which processes have access to the processor, and how much processing time each process has. This function of OS is called process scheduling. An Operating System performs the following activities for processor management:

Keeps tracks of the status of processes. The program which perform this task is known as traffic controller. Allocates the CPU that is processor to a process. De-allocates processor when a process is no more required.

1. **Device Management –**  
   An OS manages device communication via their respective drivers. It performs the following activities for device management. Keeps tracks of all devices connected to system. Designates a program responsible for every device known as the Input/Output controller. Decides which process gets access to a certain device and for how long. Allocates devices in an effective and efficient way. Deallocates devices when they are no longer required.
2. **File Management –**  
   A file system is organized into directories for efficient or easy navigation and usage. These directories may contain other directories and other files. An Operating System carries out the following file management activities. It keeps track of where information is stored, user access settings and status of every file and more. These facilities are collectively known as the file system.

**Part (b):**

Difference between TELNET and FTP

TELNET (Telecommunication Network) and FTP (File Transfer Protocol) both are the application layer protocol. They are connection oriented protocols as they create a connection between remote host and a server. AS name File Transfer Protocol, FTP is used for transferring the files from one system to another system and TELNET is used for remote login for a system.

Both of these applications allow two different computers to communicate with each other. Telnet allows the user to log on to an account on a remote computer and work as if you were there. This is useful if you are traveling or are going to be away from your own computer and your local account but need to have access to the latter. You might be at a conference in another state and suddenly remember that you need some information that is stored on a file in your account back at your home institution. You can log on remotely, telnet to your account, get into your files that are on that server, and retrieve the information. For example, let's say you are at ACTFL and you are supposed to meet some people but you forgot the time and the place. They sent you this information in an e-mail message, and you have that message in your account on the server at your institution. If you can use a computer with Internet access where you are, you can telnet to your account, call up the message, and read the information off the screen.

FTP (File Transfer Protocol) is used when you need to move files from one computer to another, whether it is between the computer at the office or school and home or even from a computer in another city. An FTP client and server are required in order to do this. Once again, you can either type "ftp" at the command prompt or click on the FTP icon to see if the client is present. To move your own files, you also need to have accounts on both computers.

TELNET is also used for chat operation while FTP is used for downloading the files.

The Port number in which TELNET is work is 23 and the Port number in which FTP is work is 20 and 21.

TELNET uses only one connection while FTP establish two connections, one is for control command and another is for data transfer.

Remote Login is necessary in TELNET and in FTP remote login is not necessary.

It does not provide high security, it provides only general security and FTP provides high security than TELNET.

It is a connection oriented protocol and FTP is also a connection oriented protocol.

**Question 3:**

Part (a):

A metropolitan area network (MAN) is a network with a size greater than LAN but smaller than a WAN. It normally comprises networked interconnections within a city that also offers a connection to the Internet.

**The distinguishing features of MAN are**

* Network size generally ranges from 5 to 50 km. It may be as small as a group of buildings in a campus to as large as covering the whole city.
* Data rates are moderate to high.
* In general, a MAN is either owned by a user group or by a network provider who sells service to users, rather than a single organization as in LAN.
* It facilitates sharing of regional resources.
* They provide uplinks for connecting LANs to WANs and Internet.

**Example of MAN**

* Cable TV network
* Telephone networks providing high-speed DSL lines
* IEEE 802.16 or WiMAX, that provides high-speed broadband access with Internet connectivity to customer premises.

**Part (b):**

The physical topology of a network refers to the configuration of cables, computers, and other peripherals

Network topology is the description of the arrangement of nodes (e.g. networking switches and routers) and connections in a network, often represented as a graph.

No matter how identical two organizations are, no two networks are exactly alike. However, many organizations are relying on well-established network topology models. Network topologies outline how devices are connected together and how data is transmitted from one node to another.

I would chose Star Topology because of these advantages:

**ADVANTAGES OF STAR NETWORK**

**Isolation of devices:**each device is isolated by the link that connects it to the hub. By so doing it makes the isolation of the individual devices simple. This isolation nature also prevents any non-centralized failure from affecting the network. In a star network, a cable failure will isolate the workstation that it links to the central computer, but only that workstation will be isolated. All the other workstations will continue to function normally, except that they will not be able to communicate with the isolated workstation.

**Simplicity:** The topology is easy to understand, establish, and navigate. The simple topology obviates the need for complex routing or message passing protocols. As noted earlier, the isolation and centralization simplifies fault detection, as each link or device can be probed individually .Due to its centralized nature, the topology offers simplicity of operation.

**If any cable is not working then the whole network will not be affected:** in a star topology, each network device has a home run of cabling back to a network hub, giving each device a separate connection to the network. If there is a problem with a cable, it will generally not affect the rest of the network. The most common cable media in use for star topologies is unshielded twisted pair copper cabling. If small numbers of devices are utilized in this topology the data rate will be high. It is best for short distance.

**You can easily add new computers or devices to the network without interrupting other nodes:**The star network topology works well when computers are at scattered points. It is easy to add or remove computers. New devices or nodes can easily be added to the Star Network by just extending a cable from the hub. If the hub adds a device for example a printer or a fax machine, all the other computers on the network can access the new device by simply accessing the hub. The device need not be installed on all the computers in the network. The central function is cost effective and easier to maintain. If the computers are reasonably close to the vertices of a convex polygon and the system requirements are modest. And also when one computer falls short then it won’t affect the whole communication.

**Centralization:**the star topologies ease the chance of a network failure by linking all of the computers to a central node. All computers may therefore communicate with all others by transmitting to and receiving from the central node only. Benefits from centralization: As the central hub is the bottleneck, increasing capacity of the central hub or adding additional devices to the star, can help scale the network very easily. The central nature also allows the check up of traffic through the network. This helps evaluate all the traffic in the network and establish apprehensive behavior.

**Easy to troubleshoot:**in a star network the whole network is reliant on the hub so if the entire network is not working then there could be a problem with the hub. This feature makes it easy to troubleshoot by offering a single point for error connection ad at the same time the dependency is also very high on that single point

**Better performance:**star network prevents unnecessary passing of the data packet through nodes. At most 3 devices and 2 links are involved in any communication between any two devices which are part of this topology. This topology encourage a huge overhead on the central hub, however if the central hub has plenty of capacity, then very high network used by one device in the network does not affect the other devices in the network. Data Packets are sent quickly as they do not have to travel through any unnecessary. The big advantage of the star network is that it is fast. This is because each computer terminal is attached directly to the central computer.

**EASY INSTALLATION:**Installation is simple, inexpensive, and fast because of the flexible cable and the modular connector.

**Question 4:**

Common media for storage, access, and transmission of information are:

Text

Graphics

Animation

Audio

Video

Multimedia in information technology refers to use of more than one of these media for information presentation to users

**Text Media**

Alphanumeric characters are used to present information in text form. Computers are widely used for text processing

Keyboards, OCRs, computer screens, and printers are some commonly used hardware devices for processing text media. Text editing, text searching, hypertext, and text importing/exporting are some highly desirable features of a multimedia computer system for better presentation and use of text information

**Graphics Media**

Computer graphics deals with generation, representation, manipulation, and display of pictures (line drawings and images) with a computer

Locating devices (such as a mouse, a joystick, or a stylus), digitizers, scanners, digital cameras, computer screens with graphics display capability, laser printers, and plotters are some common hardware devices for processing graphics media

Some desirable features of a multimedia computer system are painting or drawing software, screen capture software, clip art, graphics importing, and software support for high resolution

**Animation Media**

Computer animation deals with generation, sequencing, and display (at a specified rate) of a set of images (called frames) to create an effect of visual change or motion, similar to a movie film (video)

Animation is commonly used in those instances where videography is not possible or animation can better illustrate the concept than video impression of movement. For a jerk-free full motion animation, 25 to 30 frames per second is required

Scanners, digital cameras, video capture board interfaced to a video camera or VCR, computer monitors with image display capability, and graphics accelerator board are some common hardware devices for processing animation media

**Virtual Reality**

Virtual reality is a relatively new technology using which the user can put a pair of goggles and a glove and tour a three-dimensional world that exists only in the computer, but appears realistic to the user

**Audio Media**

Computer audio deals with synthesizing, recording, and playback of audio or sound with a computer

Sound board, microphone, speaker, MIDI devices, sound synthesizer, sound editor and audio mixer are some commonly used hardware devices for processing audio media

Some desirable features of a multimedia computer system are audio clips, audio file importing, and software support for high quality sound, recording and playback capabilities, text-to-speech conversion software, speech-to-text conversion software, and voice recognition software

**Video media**

Computer video deals with recording and display of a sequence of images at a reasonable speed to create an impression of movement. Each individual image of such a sequence is called a frame

Video camera, video monitor, video board, and video editor are some of the commonly used hardware devices for processing video media

Some desirable features of a multimedia computer system with video facility are video clips and recording and playback capabilities

***THANK YOU***