

Punjab Technical University

B.Tech. – Computer Science & Engineering (Sem. – 4th)

Operating System

Subject Code: CS-202

2 Marks Questions:-

Q:-1) What is Semaphores? (May 2012)

Ans:-1) **Semaphore:** - A hardware or software flag. In multitasking systems, a semaphore is a variable with a value that indicates the status of a common resource. It's used to lock the resource that is being used. A process needing the resource checks the semaphore to determine the resource's status and then decides how to proceed.

Q:-2) What is Round Robin Scheduling? (May 2012)

Ans:-2) **Round Robin Scheduling:-**

One of the oldest, simplest, fairest and most widely used algorithm is Round Robin (RR). In the round robin scheduling, processes are dispatched in a FIFO manner but are given a limited amount of CPU time called a **time-slice or a quantum**.

If a process does not complete before its CPU-time expires, the CPU is preempted and given to the next process waiting in a queue. The preempted process is then placed at the back of the ready list.

Q:-3) What is Open Source Software? (May 2012)

Ans:-3) Open-source software (OSS) is computer software with its source code made available and licensed with an open-source license in which the copyright holder provides the rights to study, change and distribute the software for free to anyone and for any purpose. Open-source software is very often developed in a public, collaborative manner.

Q:-4) Fragmentation of Memory? (May 2012)

Ans:-4) In computer storage, **fragmentation** is a phenomenon in which storage space is used inefficiently, reducing capacity and often performance. Fragmentation leads to storage space being "wasted", and the term also refers to the wasted space itself.

Basic principle

When a computer program requests blocks of memory from the computer system, the blocks are allocated in chunks. When the computer program is finished with a chunk, it can free the chunk back to the computer. The size and the amount of time a chunk is held by a program varies. During its lifespan, a computer program can request and free many chunks of memory.

When a program is started, the free memory areas are long and contiguous. Over time and with use, the long contiguous regions become fragmented into smaller and smaller contiguous areas. Eventually, it may become impossible for the program to request large chunks of memory.

Q:-5) What is meant by saying that program is reentrant? (May 2010)

Ans:-5) Reentrant programs become an important ingredient within a system that incorporates a high level of parallel processing. Reentrant programs allow a single copy of a program or routine to be used concurrently by two or more processes.

Q:-6) What is Time Sharing System? (May 2010)

Ans:-6) Time Sharing System refers to the concurrent use of a computer by more than one user. Users share the computer's time. *Time sharing* is synonymous with *multi-user*. Almost all mainframes and minicomputers are time-sharing systems, but most personal computers and workstations are not.

Q:-7) What is Multitasking System? (May 2010)

Ans:-7) The ability to execute more than one *task* at the same time, a task being a program. The terms *multitasking* and *multiprocessing* are often used interchangeably, although multiprocessing implies that more than one CPU is involved.

In multitasking, only one CPU is involved, but it switches from one program to another so quickly that it gives the appearance of executing all of the programs at the same time.

Q:-8) What are the main purposes of an Operating System? (May 2010)

Ans:-8) An **operating system** is the framework that allows you to communicate with computer hardware in an interactive way. Without this, you would not be able to tell the computer to do anything and it would have any instructions to follow. This is why it is important for a computer to have an operating system.

Q:-9) What are the main advantages of Multiprogramming? (May 2010)

Ans:-9) **Multiprogramming** makes efficient use of the CPU by overlapping the demands for the CPU and its I/O devices from various users.

It attempts to increase CPU utilization by always having something for the CPU to execute.

Q:-10) What do you understand by Spooling? (May 2010)

Ans:-10) **Spooling** Acronym for *simultaneous peripheral operations online*, *Spooling* refers to putting jobs in a buffer, a special area in memory or on a disk where a device can access them when it is ready.

Spooling is useful because devices access data at different rates. The buffer provides a waiting station where data can rest while the slower device catches up.

The most common spooling application is *print spooling*. In print spooling, documents are loaded into a buffer (usually an area on a disk), and then the printer pulls them off the buffer at its own rate. Because the documents are in a buffer where they can be accessed by the printer, you can perform other operations on the computer while the printing takes place in the background. Spooling also lets you place a number of print jobs on a queue instead of waiting for each one to finish before specifying the next one.

Q:-11) What is a System Call? (May 2010)

Ans:-11) As we know that for performing any Operation as user must have to specify the Operation which he wants to Operate on the Computer. We can say that For Performing any Operation a user must have to Request for a Service from the System. For Making any Request a user will prepare a Special call which is also known as the **System Call**.

Q:-12) What is a Process Control Block? (May 2010)

Ans:-12) Process Control Block

To implement the process model, the operating system maintains a table, an array of structures, called the **process table** or **process control block (PCB)** or **Switch frame**. Each entry identifies a process with information such as process state, its program counter, stack pointer, memory allocation, the status of its open files, its accounting and scheduling information. In other words, it must contain everything about the process that must be saved when the process is switched from the running state to the ready state so that it can be restarted later as if it had never been stopped. The following is the information stored in a PCB.

- **Process state**, which may be new, ready, running, waiting or halted;
- **Process number**, each process is identified by its process number, called process ID;
- Program counter, which indicates the address of the next instruction to be executed for this process;
- CPU registers, which vary in number and type, depending on the concrete microprocessor architecture;
- Memory management information, which include base and bounds registers or page table;
- I/O status information, composed I/O requests, I/O devices allocated to this process, a list of open files and so on;
- Processor scheduling information, which includes process priority, pointers to scheduling queues and any other scheduling parameters;
- List of open files.

pointer	process state
process number	
program counter	
registers	
memory limits	
list of open files	
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Q:-13) What is the difference between a Hard Real Time system and Soft Real Time system? (Dec. 2012)

Ans:-13) A **Hard Real-Time System** guarantees that critical tasks complete on time. This goal requires that all delays in the system be bounded from the retrieval of the stored data to the time that it takes the operating system to finish any request made of it.

A **Soft Real Time System** where a critical real-time task gets priority over other tasks and retains that priority until it completes. As in hard real time systems kernel delays need to be bounded.

Q:-14) What is the difference between Short term Scheduler and Long term scheduler? (Dec. 2012)

Ans:-14) Long-Term Scheduling

Long-term scheduling performs a gate keeping function. It decides whether there's enough memory, or room, to allow new programs or jobs into the system. It limits the degree of multi-tasking to prevent slow performance on currently-running programs. When a job gets past the long-term scheduler, it's sent on to the medium-term scheduler.

Short-Term Scheduling

The short-term scheduler takes jobs from the "ready" line and gives them the green light to run. It decides which of them can have resources and for how long. The short-term scheduler runs the highest-priority jobs first and must make on-the-spot decisions. **For example**, when a running process is interrupted and may be changed, the short-term scheduler must recalibrate and give the highest-priority job the green light.

Q:-15) What is the disadvantages of FCFS scheduling algorithms?

(Dec. 2012)

Ans:-15) In FCFS scheduling there is a shortcoming that is if any process of maximum burst time is comes first and after that many short burst time process comes then smaller processes have to wait for a long time until the max burst time process complete their execution.

Q:-16) Define Swapping? (Dec. 2012)

Ans:-16) Swapping is a simple memory/process management technique used by the operating system to increase the utilization of the processor by moving some blocked process from the main memory to the secondary memory (Hard Disk); thus forming a queue of temporarily suspended process and the execution continues with the newly arrived process.

Q:-17) Compare Thread and Process? (Dec. 2012)

Ans:-17) A **Thread** is associated with a process. A **Process** can have multiple threads running. When an application is started, a process is invoked and the process owns the memory, resources, and threads of execution that are associated with a running instance of an executable program.

The program runs until the thread is associated with that process. A thread is the smallest unit of execution that is intact to a process.

Q:-18) What are the two main responsibilities of an operating system? (Dec. 2011)

Ans:-18) Responsibilities of an Operating System

An Operating System has three main responsibilities:

1. Perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and

directories on the disk, and controlling peripheral devices such as disk drives and printers.

2. Ensure that different programs and users running at the same time do not interfere with each other.
3. Provide a software platform on top of which other programs (i.e., application software) can run.

Q:-19) What is Bootstrap Loader? (Dec 2011)

Ans:-19) Bootstrap Loader is a program that resides in the computers EPROM, ROM, or other non-volatile memory that automatically executed by the processor when turning on the computer. The bootstrap loader reads the hard drives boot sector to continue the process of loading the computers operating system.

Q:-20) What is Context Switch? (Dec. 2011)

Ans:-20) A Context Switch is a procedure that a computer's CPU (central processing unit) follows to change from one task (or process) to another while ensuring that the tasks do not conflict.

Q:-21) Differentiate between Preemptive and Non-Preemptive Scheduling? (Dec. 2010)

Ans:-21) Non-Preemptive: Non-preemptive algorithms are designed so that once a process enters the running state (is allowed a process), it is not

removed from the processor until it has completed its service time (or it explicitly yields the processor).

Preemptive: Preemptive algorithms are driven by the notion of prioritized computation. The process with the highest priority should always be the one currently using the processor. If a process is currently using the processor and a new process with a higher priority enters, the ready list, the process on the processor should be removed and returned to the ready list until it is once again the highest-priority process in the system.

Q:-22) What is the use of System Call. (Dec. 2010)

Ans:-22) A System call is a mechanism used by an application for requesting a service from the operating system. Examples of the services provided by the operating system are allocation and deallocation of memory, reporting of current date and time etc. These services can be used by an application with the help of system calls.

Q:-23) What is Kernel? (Dec 2010)

Ans:-23) Kernel: - The Central module of an operating system. It is the part of the operating system that loads first, and it remains in main memory. Because it stays in memory, the kernel is responsible for memory management, process and task management, and disk management.

Q:-24) What is the need of Segmentation? (Dec. 2010)

Ans:-24) Segmentation is a Memory Management Scheme that supports user view of Memory. A logical address space is a collection of segments. Each segment has a Name and a Length. The addresses specify both the segment name and the offset within the Segment.

Q:-25) Differentiate between Virus and Trojan horse? (Dec. 2010)

Ans:-25)

Virus

Computer viruses attach themselves to files or programs, infecting each computer it comes across as it spreads –often through email attachments. They replicate themselves, and most come attached to an executable file, which means a person has to actually run the program for the virus to become active and spread. Some viruses are merely annoying and slow down your computer, while others can wreak havoc on your system.

Trojan Horses

Trojan Horses are sneaky: while they appear harmless, they really are programs that hide all sorts of malicious goodies, just like when the Greeks gave a huge wooden horse to their foes, the Trojans. After the horse was within the walls of their city, Greek soldiers came out of the hollow horse belly and they were able to capture Troy. Yikes. In computers, these horses are usually very successful in duping us, because at first glance they seem to

be legitimate software. Once installed however, they can make mildly annoying changes to your computer, or they can go through and delete your files. Trojan Horses do not replicate themselves the way viruses and worms do.

Q:-26) Define Virtual Memory? (Dec. 2009)

Ans:-26) Virtual Memory is a feature of an operating system that enables a process to use a memory (RAM) address space that is independent of other processes running in the same system.

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