Processes & Threads Operating Systems - OS

1. **3 Process States?**	1)Running State - Process is being executed by CPU 2) Ready State - Process could execute on CPU when one is available 3) Blocked (waiting) State - Process is waiting for an event to happen. I/O
2. **Benefits of Multithreaded Programming?**	1) Interactively : An application may continue to run even if it is blocked or performing long operations 2) Resource Sharing: Threads share the same address space and the resources of the process to which they belong. 3) Economy : It is faster to create more threads and costly to allocated memory and resources to create of processes. It is faster to context switch. 4) Increased Concurrency in a multiprocessor architectures. A single threaded process can only run on 1 CPU whereas multithreaded process may be running parallel on different CPUs.
3. **Major Use of PCBs**	Context Switch
4. **Multithreaded Process has?**	It has multiple threads of control, and can do more than one task at a time.
5. **Not Sharing Threads?**	Not sharing has register context including program control and stack pointer. Each thread has it's own stack. -All the stacks for the various threads are located in the same data space. Each has it's own stack pointer and uses different part of this space for it's stack.
6. **Sharing Thread?**	Sharing allows memory context (code and data) but has no memory protection between threads.
7. **Two Types of Process Queues?**	Ready Queue: A list of processes that reside in memory and are ready and waiting to execute. Device Queue: A list of process waiting for a particular I/) device. Each device has its own queue.
8. **What does a process contain?**	It contains program code in the text section 1)Data: - Data section static and global variables - stack for storing temp data (e.g local variables, method parameters) - Heap which is a dynamic memory allocation 2)Contents of CPU registers e.g Data/ General Purpose registers. 3) Process state
9. **What is a Process?**	A process is a program in execution
10. **What is a Thread?**	A thread is also known as a lightweight process and is a basic unit of CPU utilisation that is under the control of a process.
11. **What is context Switch?**	This is performed by the OS to stop expecting a running process and being executing a previously ready process. To switch the CPU to another process, requires saving the execution context of the old process into it's PCB and loading the context of the new process
12. **What is the PCB and what does it include?**	-Process Control block is how a process is represented in OS. It contains the process state, process ID, values of registers (e.g Stack Pointer, Program Counter). -Also includes memory management information on base and limit registers. It finally includes scheduling and resource allocation information.
13. **What is used by OS to prevent monopolisation of resources?**	Interrupt clock, allows for a process to run for a specific time or quantum
14. **Why is a thread used?**	A single application may require to perform several tasks.