CS3.301: Operating Systems and Networks

IIIT Hyderabad

Quiz 3

1. Explain the context of "probe instructions" in Dijkstra's "My recollections of OS design" paper. List the problems caused by probe instructions.
2. Discuss the fundamental problem faced by Dijkstra when he started designing the operating system. Explain how he has employed "probe instructions" and "interrupts" in OS design.
3. What motivated Dijkstra to introduce semaphores?
4. Describe the scheduling algorithm followed in UNIX.
5. There are five levels in the operating system. Discuss the advantages of hierarchical organisation considering the sample functions or operations of level 0 and level 1. What would have happened if the services of level 0 and level 1 had been written in a single level?
6. In the UNIX system, the directory is also treated as a file, and there is a minimal difference between a file and a directory. What is the advantage of keeping the minimal difference?
7. Discuss the difference between UNIX's block I/O system and the character I/O system.
8. What are the advantages and problems of the deferred block I/O system in UNIX?
9. Discuss how the notions of hierarchy and information hiding help ease the operating system's development.
10. Consider the following levels in a hypothetical OS. Take any two operations and discuss the corresponding differences at each level.

LEVEL	NAME	OBJECTS	OPERATIONS
Level 9	Communications	Pipes	Create, Destroy, Open, Close, Read, Write
Level 10	File System	Files	Create, Destroy, Open, Close, Read, Write
Level 11	Devices(access to external devices)	Printers, Displays, and keyboards	Create, Destroy, Open, Close, Read, Write