Chapter 20: System software: Answers to coursebook questions

Exam-style Questions

1 a i 1 mark each for any of the following up to a maximum of 2: A program which has been placed in memory (1) with a process control block created (1) or has at least once entered a running state (1).

ii 1 mark each for any of the following up to a maximum of 6: New (1) entered into memory (1), ready (1) with a PCB (1), running (1) the processor is executing its instructions (1), waiting (1) has been blocked (1) process needs I/O (1), terminated (1) execution has been fully completed (1).

b i 1 mark each for any of the following up to a maximum of 4: First come first served (1) non-preemptive (1), round-robin (1) preemptive (1), prioritised or an example (1).

ii 1 mark each for any of the following up to a maximum of 2: Shortest job (1), least time remaining (1), I/O bound or CPU bound (1), length of time in queue (1).

2 a i 1 mark each for any of the following up to a maximum of 3: Partitioning creates a defined memory space assigned to be occupied by one process (1); scheduling is where the high-level scheduler assigns a program to be placed in memory to become a process (1) or where the medium-term scheduler removes a process from memory (1); paging is where a process is split into equal-sized pages and memory is divided into matching frames (1).

ii 1 mark each for any of the following up to a maximum of 2: In principle, partitioning could be used for small processes and paging for large processes (1), high-level scheduling could be based on availability of suitably sized partitions (1) or on the number of pages required for a process (1).

b i Paging (1).

ii Because not all pages need to be in memory at any one time (1), more than one process can be in the ready state (1); because memory addresses can be mapped (1), a process can have an address space larger than that of physical memory (1).

iii 1 mark each for any of the following up to a maximum of 2: Large system overhead (1) slows down execution (1); disk thrashing (1) when there is a repeated need for pages to be loaded then unloaded from memory (1)

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