

**Question 1: Processes and threads**

*Keywords:* Definition of process/thread, process-/thread-control block, 5-state process model, process creation, process image, process/thread switching, multi-threading, implementation strategies for thread support, user-/kernel-mode.

**Question 2: Scheduling**

*Keywords:* Metrics for scheduling (turnaround time, response time), simple process model, scheduling policies (FIFO, SJF, STCF, Round Robin, MLFQ, lottery scheduler).

**Question 3: Memory management**

*Keywords:* Memory hierarchy, goals for memory management (transparency, efficiency, isolation), address space, challenges for memory management, features (relocation, protection, and sharing), virtual addresses vs. physical addresses, address translation, base and bound registers, simple allocation, static allocation (non-uniform), dynamic allocation, virtual memory, segmentation.

**Question 4: Paged memory**

*Keywords:* Address types (physical, relative, virtual), address translation (page tables), virtual memory, swapping, paging, shared memory, memory use for OS, page replacement algorithms (OPT, LRU, FIFO, CLOCK).

**Question 5: Concurrency**

*Keywords:* Multi-threading, implementation strategies for multi-threading (concurrency), concurrency vs. parallelism, inter-process communication, race conditions, mutual exclusion, ensuring mutual exclusion (algorithms, hardware supported, mutexes, semaphores, monitors).

**Question 6: Concurrency problems**

*Keywords:* Definition of deadlock, mutual exclusion, resource allocation graph, Coffman's conditions, solution strategies (prevention, avoidance, detection and recovery), how to achieve deadlock prevention (breaking Coffman's conditions), safe states and deadlock avoidance, deadlock detection and recovery, livelock, priority inversion.

**Question 7: I/O, device drivers**

*Keywords:* Types of I/O (programmed, interrupt-driven, DMA), implementation of I/O (as system calls), definition and implementation of system call, device drivers.

**Question 8: XV 6**

*Keywords:* Your choice!