

CSE 332 Final

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I. QUESTION (20 POINTS)

Consider the following precedence relations between processes:

- P1 before P2 and P4
- P2 before P3 and P4
- P3 before P5
- P6 after P1 and P4

Using semaphores, write each process that enforce the above precedence relations.

II. QUESTION (18 POINTS)

Consider a file currently consisting of 100 blocks. Assume that the file control block (and the index block, in the case of indexed allocation) is already in memory. Calculate how many disk I/O operations are required for contiguous, linked, and indexed (single-level) allocation strategies, if, for one block, the following conditions hold. In the contiguous-allocation case, assume that there is no room to grow in the beginning, but there is room to grow in the end. Assume that the block information to be added is stored in memory.

- The block is added at the beginning
- The block is added in the middle
- The block is added at the end

III. QUESTION (18 POINTS)

Mark the following programming techniques and structures as good or not good for a demand paged environment:

- Stack
- Sequential Search
- Pure code
- Indirection
- Hash Table
- Binary Search
- Link List
- Queue
- Double Link List

IV. QUESTION (12 POINTS)

For three strategies of allocation namely contiguous, linked, and indexed allocation;

- Which one has the most advantage if the file is small and needs random access?
- Which one has the most advantage if the file is large and needs sequential access?
- Which one has the most advantage if you know the exact size of the file?

V. QUESTION (12 POINTS)

- What is Beladys anomaly?
- Describe the bitmap representation of the free disk space.

VI. QUESTION (20 POINTS)

- A CPU scheduling algorithm determines an order for the execution of its scheduled processes. Given 5 processes namely P_1, P_2, P_3, P_4, P_5 to be scheduled on one processor (they can come in any order), how many possible different schedules are there?
- Given 5 processes namely P_1, P_2, P_3, P_4, P_5 to be scheduled on two processors (they must come in this order), how many possible different FCFS schedules are there?