**Operating System**

Set A

Attempt any two [2 × 10 = 20]

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| 1. For the processes listed in following table, draw a Gantt chart illustrating their execution using: | |
| (a)First-Come-First-Serve.  (b)Short-Job-First.  (c)Shortest-Remaining-Time-Next.  (d)Round-Robin (quantum = 2).  (e) Round-Robin (quantum = 1). | |
| **Processes Arrival Time** | **Burst Time** |
| A 0.00 | 4 |
| B 2.01 | 7 |
| C 3.01 | 2 |
| D 3.02 | 2 |

1. Suppose that a disk drive has 100 cylinders, numbered 0 to 99. The drive is currently serving a request at cylinder 43, and previous request was at cylinder 25. The queue of pending request, in FIFO order is: 86, 70, 13, 74, 48, 9, 22, 50, 30

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests for each of the following disk scheduling algorithms?

* 1. FCFS
  2. SCAN

1. What do you mean by file system? What are the major difference between file system interfaces and file system implementation? Explain.

Attempt any eight [8 × 5 = 40]

1. Differentiate between multitasking and multiprocessing.
2. Differentiate between process and thread. What are I/O bound processes and CPU bound processes.
3. Five jobs are waiting to be run. Their expected run times are 9, 6, 3, 5, and *X*. In what order should they be run to minimize average response time?
4. Explain how deadlocks are detected and corrected?
5. What do you mean by memory fragmentation? Distinguish between the internal and external fragmentation
6. Under what circumstances do page fault occur? Describe the action taken by the operating system when a page fault occurs.
7. Explain the disk management with example.
8. Compare SCAN and SSTF with example
9. Write short notes on:
   1. Disk quota
   2. LFU page replacement algorithm

**Operating System**

Set B

Attempt any two [2 × 10 = 20]

1. Five batch jobs A through E, arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4, and 8 minutes. Their (externally determined) priorities are 3, 5, 2, 1, and 4, respectively, with 5 being the highest priority. For each of the following scheduling algorithms, determine the mean process turnaround time. Ignore process switching overhead.
   1. Round robin.
   2. Priority scheduling.
   3. First-come, first-served (run in order 10, 6, 2, 4, and 8).
   4. Shortest job first.
   5. For (a), assume that the system is multi-programmed, and that each job gets its fair share of the CPU. For (b) through (d) assume that only one job at a time runs, until it finishes. All jobs are completely CPU bound.
2. Disk requests come in to the disk driver for cylinders 10, 22, 20, 2, 40, 6, and 38, in that order. A seek takes 6 msec per cylinder moved. How much seek time is needed for
   1. First-Come, first served.
   2. Closest cylinder next.
   3. Elevator algorithm.
   4. In all cases, the arm is initially at cylinder 20.
3. Write short notes on :

(a) Disk scheduling algorithms

(b) Error handling and formatting

(c) File operations

Attempt any eight [8 × 5 = 40]

1. On all current computers, at least part of the interrupt handlers is written in assembly language. Why?
2. What resources are used when a thread is created? How do they differ from those used when a process is created?
3. What are the difference between a deadlock prevention and deadlock Avoidance?
4. What is the difference between a physical address and a virtual address?
5. If FIFO page replacement is used with four page frames and eight pages, how many page faults will occur with the reference string 0172327103 if the four frames are initially empty? Now repeat this problem for LRU.
6. Compare demand paging and segmentation?
7. Explain about hierarchical directory systems with diagrammatic examples.
8. Round-robin schedulers normally maintain a list of all run able processes, with each process occurring exactly once in the list. What would happen if a process occurred twice in the list? Can you think of any reason for allowing this?
9. Write short notes on:
   1. File Structure
   2. The First-In, First-Out (FIFO) Page Replacement Algorithms.