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MCS-203

**POST GRADUATE DIPLOMA IN
COMPUTER APPLICATIONS
(PGDCA-NEW)**

Term-End Examination

December, 2024

MCS-203 : OPERATING SYSTEMS

Time : 3 Hours

Maximum Marks : 100

Weightage : 70%

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **three** questions from the
rest.*

1. (a) Explain the significance of disk scheduling.

Discuss the Shortest Seek Time First (SSTF) and SCAN scheduling algorithms.

Trace the total head movement with SSTF and SCAN scheduling by representing them through a diagram for the following

disk queue : 10

49, 90, 149, 41, 129, 17, 139, 69, 60

Assume that the disk head is initially at 49.

- (b) Define a deadlock. List and explain all the *four* conditions that are must to create the deadlock situation. 5

- (c) Define a mobile operating system and explain the features of iOS. 5

- (d) The following is the sequence of page-requests :

1, 2, 5, 4, 2, 1, 3, 2, 6, 4

Assume that there are four frames. How many page faults will occur if the following page replacement algorithms are used to replace the pages ? 10

- (i) First Come First Serve (FCFS)
- (ii) Least Recently Used (LRU)
- (iii) Least Frequently Used (LFU)

- (e) Write and explain producers-consumers problem. Also, provide the solution for the problem using semaphores. 10
2. (a) What is Interprocess communication ? Explain how it is performed in Windows-10. 5
- (b) With the help of a diagram, explain all the main components of LINUX operating system. 5
- (c) Discuss the layered architecture of Android OS, with the help of a diagram. 10
3. (a) List and explain the techniques available for synchronization in multiprocessors. 10

- (b) Write and explain Lamport's Bakery Algorithm for mutual exclusion in distributed systems. 10
4. (a) List and explain the design issues in mobile operating systems. 8
- (b) Define virtual memory and discuss its principle of operation with the help of a suitable diagram. 8
- (c) What is the difference between a loosely coupled system and a tightly coupled system ? Give examples for each. 4
5. Write short notes on the following : $4 \times 5 = 20$
- (a) Memory management in LINUX

- (b) Segmentation (memory management scheme)
- (c) Locks (Process synchronization mechanism)
- (d) Some of the commonly used directories in iOS

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