

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

Term-End Examination

December, 2023

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) Consider the following set of processes (P₁, P₂, P₃, P₄, P₅) with the length of the CPU burst time given in milliseconds along with the arrival time :

Process	Arrival Time	CPU Burst Time
P ₁	1	6
P ₂	2	4
P ₃	4	1
P ₄	3	2
P ₅	5	3

Draw Gantt charts illustrating the execution of the processes using FCFS, SJF and RR (with quantum = 2) scheduling algorithms. Also find the average turn around time, average waiting time, processor utilization and throughput for all the algorithms. 10

- (b) Following is the sequence of page requests :

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

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

10

- (i) Least Recently Used (LRU)
 - (ii) First Come First Serve (FCFS)
- (c) Define a semaphore. Using semaphores, write and explain the algorithm that solves the Reader's and Writer's problem. 10
- (d) Discuss the security features in LINUX with respect to the following : 10
- (i) User Accounts
 - (ii) File Permissions
 - (iii) Encrypted Storage
 - (iv) Remote Access

2. (a) There are three main alternative ways to structure a distributed application as shown below : 10
- (i) Client/Server (and RPC)
 - (ii) Distributed objects
 - (iii) Distributed shared memory
- Explain all the three models with the help of block diagrams respectively.
- (b) Discuss the following mechanisms/techniques suitable for synchronization in multiprocessors : 10
- (i) Test-and-set
 - (ii) Compare-and-swap
3. (a) Describe the evolution of iOS. Also, discuss the features of iOS operating system. 10
- (b) Explain the process management and process scheduling in Windows-10. 10
4. (a) With reference to wireless communication, explain the following 'two-unit configuration' ways of device communication : 10
- (i) Infrared connection

(ii) Bluetooth connection

(iii) Near Field Communication (NFC)

Also mention the drawbacks, if any, with the 'two-unit configuration' model/technique.

(b) Explain the memory management in Android Operating System. 10

5. Write short notes on the following : 4×5=20

(a) Demand segmentation

(b) Deadlock avoidance

(c) Windows *vs.* Linux operating system

(d) Remote Procedure Call (RPC)