No. of Printed Pages : 5

MCS–203

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA–NEW)

Term-End Examination

December, 2025

MCS-203 : OPERATING SYSTEMS

Time : 3 Hours *Maximum Marks : 100*

Weightage : 70%

Note : *Question No.* ***1*** *compulsory. Attempt any* ***three*** *questions from the rest.*

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1. (a) What do you understand by CPU bound programs and I/0 bound programs ?

What are the various process management functions that are performed by the operating systems ? 10

(b) What are Semaphores ? How is the Dining Philosopher problem solved using semaphores ? 10

(c) List and explain design issues involved in Distributed Systems. 10

(d) Explain in detail the process management in WINDOWS 10. 10

2. (a) Consider the following page reference string :

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms, assuming four frames ? Remember all frames are initially empty, so your first unique pages will all cost one fault each : 10

(i) LRU replacement

(ii) FIFO replacement

(b) Define a deadlock. How can the deadlock be prevented using Havender's algorithm ? 10

3. (a) Explain the abstract model of virtual address to physical address mapping. Also, explain the use of valid and invalid bits in page table. 10

(b) Consider a disk queue with requests for I/O to blocks on cylinders 47, 38, 121, 191, 87, 11, 92, 10. The SCAN scheduling algorithm is used. The head is initially at cylinder number 63, moving towards larger cylinder numbers on its servicing pass. The cylinders are numbered from 0 to 199. Find the total head movement (in number of cylinders) incurred while servicing these requests. 10

4. (a) What is Remote Procedure Call (RPC) ? How does it work ? What are the limitations of Remote Procedure Call ? 10

(b) Give the complete layered architecture of iOS. Briefly explain about each layer and their significances. 10

5. Write short notes on any *four* of the following : 4×5=20

   (a) Distributed Mutual Exclusion

   (b) Difference between Processes and Threads

   (c) Symbian Operating Systems

   (d) Memory Management in Linux

   (e) Features of WINDOWS 10 operating systems

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