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MCS-203

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

Term-End Examination

June, 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) Define a Semaphore. List and explain the two standard atomic operations of it. Also write the solution to producer-consumer problem using semaphores and explain. 10

(b) Using SSTF and C-SCAN disk scheduling algorithms, calculate the total head

movement for the following block sequence : 10

61, 141, 40, 160, 15, 63, 60, 125

Note : Initially the head is at cylinder numbered 0.

(c) Define segmentation. Explain with the help of a diagram, the address mapping scheme used in segmentation. 10

(d) With the help of a diagram, explain the fundamental architecture of LINUX operating system. 10

2. (a) For the reference string as shown below : 0, 1, 3, 4, 6, 4, 3, 9, 6, 4 and with 3 memory frames, calculate the number of page faults using OPT and FCFS page replacement algorithms. 10

(b) Write and explain "Banker's algorithm" for Deadlock Avoidance proposed by Dijkstra. 10

3. (a) List and explain the design issues involved in distributed systems. 10

(b) With the help of a diagram, explain "Distributed Shared Memory" application model. 10

4. (a) Describe multiprocessor OS functions and requirements. With respect to synchronization in multiprocessors, explain test-and-set, compare-and-swapes and fetch-and-add techniques. 10

   (b) Write briefly about the following types of processors used in mobile devices : 10

      (i) Qualcomm Snapdragon

      (ii) Intel Atom Processor

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

   (a) Design issues in Mobile OS

   (b) File system management in Windows 10

   (c) Security features in LINUX

   (d) Memory management in Android

   (e) iOS directories and iCloud container of iOS