MCA (Revised)
Term-End Examination
June, 2018

MCS-041 : OPERATING SYSTEMS

Time : 3 hours   *Maximum Marks : 100*

(Weightage : 75%)

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

1. (a) What is a Critical Section ? Give a monitor solution to the Dining philosophers' problem and explain. **10**

    (b) Describe Linked and Indexed allocation for disk space allocation. **10**

    (c) Consider the page reference string :
    1, 2, 3, 4, 2, 5, 3, 4, 2, 6, 7, 8, 7, 9, 7, 8, 2, 5, 4 and 9
    Calculate how many page faults would occur for LRU and FIFO page replacement algorithms, when the number of frames is 3. Assume all frames are initially empty. **10**

    (d) What is RPC ? Describe the steps involved in the execution of a RPC. **10**

2. (a) Define a Process. Explain various states of a process. How does a process differ from a thread ? *10*

(b) With the help of a neat diagram, explain segmented paging and paged segmentation. *10*

3. (a) Consider the following set of processes with the length of CPU burst time given in milliseconds :

Process	Burst time (msec)	Arrival time (msec)	Priority
P1	24	0	4
P2	7	3	3
P3	6	5	2
P4	10	10	1

(i) Draw Gantt chart for FCFS, SJF and RR (quantum = 4) scheduling algorithms.

(ii) Calculate the average waiting time and turnaround time for each of the above mentioned algorithms.

Note : A smaller priority number implies higher priority. *10*

(b) Explain Access Matrix and Mandatory Access Control Security Models. *10*

4. (a) Explain RAID with different levels. Give the features of each level. 5

(b) Explain the concept of Thrashing. How can we prevent it ? 5

(c) Discuss any SCAN and C-SCAN disk scheduling algorithms. List the advantages of SCAN over C-SCAN algorithm. 10

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

(a) Multiprocessor Operating System

(b) Fault Tolerance in Distributed Systems

(c) Characterization of Deadlock

(d) Overlays and Swapping