PAPER ID-311142

Subject Code: RCA301

Roll No: | | | | | | | | | | | | | |

MCA
(SEM III) THEORY EXAMINATION 2020-21
OPERATING SYSTEM

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	What are Multi processor systems?
b.	What are CPU bound and I/O bound processes?
c.	What is dispatcher?
d.	Differentiate between process and thread.
e.	Define graceful degradation?
f.	What is the use of job scheduler?
g.	What do you mean by system calls?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Discuss various operating system services with example.
b.	Find the average waiting time (A.W.T) and average turnaround time (A.T.A.T) for executing the following process using (i) Preemptive shortest-job first (ii) Non-preemptive shortest-job first? Process Arrival time Burst time P1 0 5 P2 1 13 P3 2 8 P4 3 4 P5 4 10
c.	What is information in the PCB? Discuss it with diagram.
d.	Define critical section problem. Explain Peterson's solution to solve critical section problem for three processes.
e.	What is process synchronization? Give the solution to reader writer problem using semaphores.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Differentiate between: (i) Hard and soft real time system. (ii) Paging and segmentation.
(b)	Suppose we have five processes and three resources, A, B, and C. A has 10 instances, B has 5 instances and C has 7 instances. Can the system execute the following processes without deadlock occurring, if yes find safe sequence? Process Allocation Maximum A B C A B C P1 0 1 0 7 5 3 P2 2 0 0 3 2 2 P3 3 0 2 9 0 2 P4 2 1 1 2 2 2 P5 0 0 2 4 3 3

Roll No: | | | | | | | | | | | | | |

4. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	Discuss the following storage placement strategies with suitable examples : (i) Best fit (ii) First fit (iii) Worst fit
(b)	Consider the following page reference string : 1 , 2 , 3 , 4 , 2 , 4 , 5 , 6 , 3 , 1 , 2 , 3 , 4 , 6 , 4 , 5 , 2 , 6. Calculate number of page faults using LRU and OPTIMAL Page replacement algorithm. Assume number of frames as three.

5. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	Which allocation scheme will minimize the amount of space required in Directory structure and why?
(b)	Explain the concept of segmentation with proper diagram.

6. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	What is deadlock? How can we avoiding deadlocks occur? Explain it.
(b)	Given the following queue -- 95, 180, 34, 119, 11, 123, 62, 64 with the Read-write head initially at the track 50 and the tail track being at 199. Find the head movement for Shortest Seek Time First (SSTF) SCAN and Circular SCAN Algorithm.

7. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	Discuss DMA transfer and DMA controller.
(b)	What do you mean by cache memory? Discuss various mapping technique of cache memory.