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### MCADD-401

### M.C.A. (Integrated), IV Semester

Examination, May 2019

### Operating Systems

Time : Three Hours

Maximum Marks : 70

- Note :
- i) Attempt any five questions.
  - ii) All questions carry equal marks.

1. a) What is the difference between Batch processing, Real time processing, Time sharing and Distributed processing?
- b) Consider the following process.

PROCESS	ARRIVAL TIME	SERVICE TIME
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Solve the above problem with Shortest Remaining Time First, round robin by drawing Gantt schart and also calculate the average waiting time and turnaround time. Also calculate throughput.

2. a) What is a process? Discuss components of process and various states of a process with the help of a process state transition diagram.
- b) List the advantage and disadvantage of writing an operating system in high level language as C.

3. a) Draw the diagram of segmentation memory management scheme and explain its principle.  
 b) When do page faults occur? Consider the 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 and page fault rate occur for the FIFO, LRU algorithm, assuming one, two, three, four page frames?
4. a) Discuss the logical and physical address spaces.  
 b) Consider a system where the virtual memory page size is 2K (2048 bytes), and main memory consists of 4 page frames. Now consider a process which requires 8 pages of storage. At some point during its execution, the page table is as shown below:

Virtual page	Valid	Physical page
0	No	
1	No	
2	Yes	1
3	No	
4	Yes	3
5	No	
6	Yes	0
7	Yes	2

Give the main memory (physical) addresses for each of the following virtual addresses (all numbers decimal):

- i) 8500
  - ii) 14000
  - iii) 5000
  - iv) 2100
5. a) Discuss the dining philosopher problem with its solution.  
 b) Explain Bankar's Algorithm with example.

6. Disk requests come into the disk driver for cylinders 10, 22, 20, 2, 40, 6, and 38, in that order. Assume that the disk has 100 cylinders.

A seek takes 6 m sec per cylinder moved. Compute the average seek time for the request sequence given above for

- i) First-come, First-served
- ii) Shortest Seek Time First (SSTF)
- iii) LOOK ( with the disk-arm initially moving towards higher number cylinders from lower number cylinders)
- iv) C-SCAN

In all the cases, the arm is initially at cylinder 20.

7. a) Describe the major activities of operating system with regard to file management.  
b) List the advantages of direct memory access.
8. a) Why performance monitoring and evaluation are needed?  
b) How distributed file system is different from centralized file system?

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