1129
B. E. (Information Technology)
Fifth Semester
ITE-543: Operating System

Time allowed: 3 Hours   Max. Marks: 50

NOTE: *Attempt _five_ questions in all, including Question No. I which is compulsory and selecting two questions from each Part.*

x-x-x

1. i) Define Timesharing and Multiprogramming operating systems?
   ii) What is Race Condition?
   iii) What is Sector sparing and sector slipping?
   iv) Define Busy waiting?
   v) What are the necessary conditions for deadlock to occur?   (10)

Part A

2. Consider the following set of processes with the CPU burst time in milliseconds:

Process	Burst Time	Priority	Arrival time
P0	9	3	0
P1	2	2	1
P2	5	4	2
P3	4	5	3
P4	2	1	4

The processes are assumed to arrive in the order: P0, P1, P2, P3, P4.
a). Give Gantt Charts illustrate the execution of these processes using FCFS, SJF (pre-emptive), Priority (pre-emptive) and Round Robin (quantum=4), scheduling.
b). Calculate the average turnaround time and average waiting time for each of the scheduling algorithm in part a?   (10)

3. Consider the following snapshot of a system:

Process	Allocation A B C	Max A B C	Available A B C
P1	2 2 3	3 6 8	7 7 10
P2	2 0 3	4 3 3	
P3	1 2 4	3 4 4	

Explaining Banker's Algorithm, answer the following
   a). What is the content of matrix NEED?
   b). Is the system in a safe state?
   c). If a request from P1 arrives for (1,1,0), can it be granted immediately?   (10)

4. a). Consider a paging system with the page table stored in memory.
   a). If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?
   b). If we add associative registers and 75% of all page table references are found in associative registers, what is the effective memory reference time? (Assume that finding a page table entry in the associative registers takes 0 time , if the entry is there?   (10)

   b). What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can system do to eliminate this problem?

Part B

5. What do you mean by Disk Scheduling. Explain any two Disk scheduling algorithms with example.   (10)

6. a). Explain - Data Migration, Computation Migration and Process Migration?   (5)
   b). Compare the techniques for caching disk blocks locally on a client system and remotely on a server?   (5)

7. a). Explain briefly algorithms for electing a coordinator in case of failure?   (5)
   b). Discuss the layout of UNIX file system? What is the structure of i-node? How does the path name get translated to i-node number?   (5)

x-x-x