18CS43 SIMP Questions

Prepared by the CSE-TIE review team

Module-5

1. Given the following sequences 95,180,34,119,11,123,62,64 with the head initially at track 50 and ending at track 199. What is the total disk traveled by the disk arm to satisfy the request using FCFS, SSTF, LOOK and CLOOK algorithm.
2. Explain the following disk scheduling algorithm in brief with examples: i) FCFS scheduling ii) SSTF scheduling iii) SCAN scheduling iv)LOOK scheduling
3. Explain the following (i)Bad block recovery in disk (ii)Design principle of linux (iii)Process management in linux (iv)Access matrix and its implementation
4. Explain the components of the Linux system with a neat diagram, also briefly describe various linux kernel modules
5. Explain the interprocess communication mechanisms in Linux.
6. Explain the components of Linux system with a neat diagram.

Module-3

1. What are the necessary conditions for deadlock? Explain different methods to recover from deadlock,also mention 4 necessary conditions that arise deadlocks
2. Consider the following snapshot of a system

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	0	2	0	0	4	1	0	2
P_1	1	0	0	2	0	1			
P_2	1	3	5	1	3	7			
P_3	6	3	2	8	4	2			
P_4	1	4	3	1	5	7			

Find the need matrix and calculate safe sequence using Banker's Algorithm. Mention the above system is safe or not safe

3. Assume that there are 5 processes P0 through P4 and 4 types of resources. At time T0 we have the following state:

Apply Banker's algorithm to answer the following questions:

i) What is the content of need matrix?

ii) Is the system in a safe state?

iii) If a request from process P1 arrives for(0,4,2,0) can th request be granted?

4. Given memory partitions of 200K,700K,500K,300K and 400K. How each of the first fit, best fit and worst fit algorithms place processes of 315KB,427KB,250 KB and 550 KB size
5. Determine whether the following system is in safe state by using Banker's algorithm

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

If a request for P1 arrives for (1,0,2), can the request be granted immediately?

6. Explain paging and segmentation with diagrams/method of segmentation
7. Illustrate with example, the internal and external fragmentation problem encountered in continuous memory allocation.

Module-1

1. Define OS with a neat diagram, Explain its dual mode operation also explain the services of operating system that are helpful for user and the system
2. With a neat diagram, explain the different states of a process and process control block
3. Distinguish between the following items: i) Multiprogramming and multitasking (time sharing) (ii)Multiprocessor systems and clustered systems
4. Discuss the methods to implement message passing IPC in detail.
5. Explain (i)Microkernels (ii)Multiprocessor systems (iii)Term scheduling (iv)Types of clustering (v)VM

Module-2

1. Explain multithreading models, also list the benefits of multithreaded programming.
2. Consider the following set of processes given in table

Process	Arrival time(sec)	Burst time(Sec)	Priority
1	0	10	4
2	3	5	2

3	3	6	6
4	5	4	3

Consider larger numbers as the highest priority. Calculate average waiting time and turn around time and draw Gannt chart for preemptive priority scheduling and preemptive SJF scheduling

3. Illustrate Peterson's solution for critical section problems and prove that the mutual exclusion property is preserved.
4. Show how semaphore provides a solution to the reader-writers problem.
5. Explain Dining-Philosophers problem using monitors
6. Consider the five processes arrive at time 0, in the order given, with the length of CPU burst given in milliseconds

Process	Burst time
1	10
2	29
3	3
4	7
5	12

Consider the FCFS, SJF an RR (quantum = 10msec) scheduling, draw the Gantt chart for each of the scheduling. Determine average waiting time and average turnaround time for all the 3 scheduling algorithm. Which algorithm would give the minimum average waiting time?

Module-4

1. For the following page reference string 1 2 3 4 1 2 5 1 2 3 4 5. Calculate the page faults using FIFO and LRU for memory with 3 and 4 frames
2. What do you mean by free space list? With suitable examples, explain any 3 methods of free space list implementation.
3. Write short notes on linked and indexed allocation methods with a neat diagram.
4. Describe various file allocation methods and various types of directory structures
5. Explain the following (i)Access methods of files (ii)Different types of files (iii)System mounting (iv)Thrashing (v)Various file allocation methods -20M
6. Explain (i)Page fault (ii)copy on write process (iii)Allocation methods in disk (iv)Different directory structure (v)Different file operations -20M
7. Consider the page reference string for a memory with three frames, how many page faults will occur for FIFO, LRU and optimal page replacement algorithms. Which is more efficient? Reference string : 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1