USN

Sixth Semester B.E. Degree Examination, July/August 2022
Operating Systems

Time: 3 hrs.

Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Explain the dual mode operation in OS with a neat diagram. **(06 Marks)**
   b. Differentiate between multiprogramming and Time sharing systems. **(04 Marks)**
   c. What are system calls? Briefly explain the different types of system calls. **(06 Marks)**

OR

2 a. With a neat diagram, explain the different states of a process. **(08 Marks)**
   b. What is IPC? Explain the shared memory and message passing IPCs in detail. **(08 Marks)**

Module-2

3 a. Consider the following set of processes, smaller number represents highest priority. Calculate the turn around and waiting time for FCFS, SJF and priority scheduling. Draw Gantt Chart to explain.

Processes	Arrival Time	Burst Time	Priority
P_1	0	8	4
P_2	2	6	6
P_3	2	10	3
P_4	5	2	2

(09 Marks)

   b. Explain the threading issues in detail. **(07 Marks)**

OR

4 a. What is Critical section problem and solutions to the problem? How to solve it using semaphores? **(08 Marks)**
   b. Explain the classical synchronization problem Dining philosopher's problem in detail. **(08 Marks)**

Module-3

5 a. What are the necessary conditions for Deadlock to occur? How to recover from Deadlocks? **(08 Marks)**
   b. For the given set of co-processes find out the given system has safe sequence or not.

Allocation				Maximum				Available			
A	B	C	D	A	B	C	D	A	B	C	D
0	0	1	2	0	0	1	2	1	5	2	0
1	0	0	0	1	7	5	0				
1	3	5	4	2	3	5	6				
0	6	3	2	0	6	5	2				
0	0	1	4	0	6	5	6				

   i) What is the content of need matrix?
   ii) Is the system in a safe state, if so, mention the safe sequence? **(08 Marks)**

OR

6 a. What is paging? Differentiate between paging and segmentation. **(05 Marks)**

b. Explain the structure of page table in detail. **(05 Marks)**

c. Give example and explain the dynamic storage allocation problem? What are the possible solutions to it? **(06 Marks)**

Module-4

7 a. For the given reference string 7, 0, 1, 2, 3, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 7, 1, 0 assuming frame size if 4, apply LRU, FIFO and optimal algorithm and find which algorithm is most efficient. **(08 Marks)**

b. What is page fault? With a neat diagram, explain the steps in handling the page fault. **(08 Marks)**

OR

8 a. What are the different storage allocation methods? Explain any two. **(05 Marks)**

b. Explain about MBR and booting process in detail. **(06 Marks)**

c. What is file? Explain file mounting. **(05 Marks)**

Module-5

9 a. Explain Access control Matrix with neat diagram. Briefly explain Revocation of Access rights. **(08 Marks)**

b. Apply the disk scheduling algorithm FCFS, SSTF and SCAN for the following cylinders. Starting position of cylinder is at 85 pending requests in the order 92, 113, 35, 67, 89, 145 and 198. Find out which is the most efficient algorithm. **(08 Marks)**

OR

10 a. Explain the design principle of Linux OS. **(08 Marks)**

b. Explain the IPC mechanism in Linux briefly. **(04 Marks)**

c. Differentiate between processes and threads in Linux. **(04 Marks)**

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