

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech I Semester Regular/Supplementary Examinations, Dec-2023/Jan-2024

OPERATING SYSTEMS

(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours**Max. Marks: 75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. What are the differences between process and thread?	CO1	L2	2M
2. What is the time-sharing system?	CO1	L1	3M
3. Explain various multithreading models.	CO2	L2	2M
4. What is Context Switching?	CO2	L1	3M
5. What are the necessary conditions for Deadlock?	CO3	L1	2M
6. Explain swap space management.	CO3	L2	3M
7. What is Thrashing?	CO4	L1	2M
8. Difference between Internal and External Fragmentation.	CO4	L2	3M
9. What is System Security?	CO5	L1	2M
10. Explain about Network Threat.	CO5	L2	3M

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Describe different types of operating systems. CO1 L3 10M
OR
 B) List out the different types of system calls. CO1 L2 10M
12. A) Consider the following set of processes, with the length of the CPU burst given in milliseconds:
- | Process | Burst Time | Priority |
|---------|------------|----------|
| P_1 | 2 | 2 |
| P_2 | 1 | 1 |
| P_3 | 8 | 4 |
| P_4 | 4 | 2 |
| P_5 | 5 | 3 |
- The processes are assumed to have arrived in the order $P_1, P_2, P_3, P_4,$ and P_5 at time 0.
 Apply non-preemptive priority (a larger priority number implies a higher priority) CPU scheduling algorithms to calculate average waiting time and average turnaround time.
OR
 B) Apply semaphores to provide synchronization for Producer-Consumer and Readers-Writers Problem. CO2 L3 10M

13. A) Consider the following snapshot of a system: CO3 L3 10M
 Answer the following questions using the banker’s Algorithm
 i) Apply Banker’s Algorithm and find whether the above system is safe or not. And also identify the safe sequence that meets the safety requirement.
 ii) If a request from process P3 arrives for (0, 1, 0, 1), can the request be granted immediately?

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	2	0	0	1	4	2	1	2	3	3	2	1
P1	3	1	2	1	5	2	5	2				
P2	2	1	0	3	2	3	1	6				
P3	1	3	1	2	1	4	2	4				
P4	1	4	3	2	3	6	6	5				

OR

- B) Apply SSTF, disk-scheduling algorithms to calculate total distance (in cylinders) that the disk arm moves to satisfy all the pending requests. The queue of pending requests, in FIFO order is: 2,069, 1,212, 2,296, 2,800, 544, 1,618, 356, 1,523, 4,965, and 368. Let us assume that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving a request at cylinder 2,150, and the previous request was at cylinder 1,805. CO3 L3 10M

14. A) Explain the paging techniques for structuring the page tables. CO4 L2 10M

OR

- B) Analyze the FIFO and LRU page replacement algorithms by considering the number of page faults would occur with following page reference string (five page frames): 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. CO4 L3 10M

15. A) Discuss the advantages and disadvantages of different directory structure. CO5 L2 10M

OR

- B) Explain about Goals and Principles of System Protection. CO5 L2 10M