Question Paper Code: R18A31CS04

R18

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech I Semester Supplementary Examinations, December – 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.	Explain the main purpose of an operating system?	CO1	L2	2M
2.	Explain about Inter process communication?	CO1	L2	3M
3.	Differences between preemptive and non-preemptive Scheduling.	CO2	L2	2M
4.	Differences between Multithreading and Multitasking.	CO2	L2	3M
5.	Explain about methods handling for deadlock.	CO3	L2	2M
6.	Draw the structure of Disk.	CO3	L1	3M
7.	What is TLB?	CO4	L1	2M
8.	What is Demand Paging?	CO4	L1	3M
9.	Explain different Storage Devices.	CO5	L2	2M
10.	Difference between System Threat and Network Threat.	CO5	L2	3M

Section B (Essay Questions)

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

11. A)	Explain about operating system services.	CO1	L2	10M
	OR			
B)	List out different Operations on processes.	CO1	L2	10M
12. A)	Consider the following set of processes, with the length of the CPU burst time given in milliseconds: Process Burst Time P1 5 P2 3 P3 1 P4 2 P5 7 The processes are assumed to have arrived in the order P1, P2, P3, P4, and P5 all at time 0. Draw Gantt charts and apply RR (quantum = 2) CPU scheduling to calculate waiting time and turnaround time of each process.	CO2	L3	10M
	OR			
B)	Apply Monitors to provide synchronization for Dining Philosophers problem.	CO2	L3	10M

13. A) Considering a system with five processes P0 through P4 and three resources of type A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t0 following snapshot of the system has been taken: CO3 L3 10M

Process	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	

i)What will be the content of the Need matrix?
ii) Is the system in a safe state? If Yes, then what is the safe sequence?

OR

B) Apply C-SCAN 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: 86, 147, 91, 177, 94, 150, 102, 175, and 130. Let as assume that a disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. CO3 L3 10M

14. A) Explain the Virtual memory management in detail. CO4 L2 10M

OR

B) Analyze the LRU and Optimal page replacement algorithms by considering the number of page faults would occur with the following page reference string (four-page frames): 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2. CO4 L3 10M

15. A) Explain different operations on Files. CO5 L2 10M

OR

B) Describe the contiguous, linked, and indexed methods of allocating disk space. CO5 L2 10M