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(Printed Pages 4)

Roll No. _____

23/3199

B.C.A. (Fourth Semester) Examination, 2023

Second Paper

(Operating System)

Time : 3:00 Hours] *[Maximum Marks : 75*

Note : Attempt any **five** questions. **All** question carry equal marks.

Note : The answers to short answer type questions should not exceed **200** words and the answers to long answer type questions should not exceed **500** words.

1. What are the various criteria for a good process scheduling algorithm? Explain any two preemptive scheduling Algorithm. 15

2. (a) Explain the concept of thrashing with the help of diagram. How can we prevent it? 7½

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(b) What is critical section problem? Discuss any one solution of critical section problem. 7½

3. (a) Explain with a diagram, how paging supports the virtual memory. Also explain how a logical address is translated into a physical address in paging with the help of diagram. 7½

(b) Consider the following set of processes with the arrival time and the CPU burst times given in milliseconds What is the average turn around time with round robin (RR) scheduling algorithm if time quantum is 3 millisecond. Also draw the Gantt chart of scheduling. 7½

Process	Arrival time	CPU Burst time
Po	0	5
P_1	1	3
P_2	2	8
P_3	3	6

4 Describe the process states with the help of a state diagram. Define process control block (PCB) and it's role in the context of switching of the process. 15

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5. (a) Differentiate between Fixed and variable partition. 5

(b) Give five memory partitions of 100KB, 500KB, 200KB, 300KB. and 600KB (in order), how would each of the First-fit, best fit and worst fit algorithms place process of 212Kb, 417KB, 112 KB and 426KB (In order)? Which algorithm makes the most efficient use of memory? 10

6. Discuss the following in brief: 15

(a) Internal and External fragmentation

(b) Time sharing systems and Real time systems.

(c) Logical file system and physical file system. https://www.mgkvponline.com

7. (a) Discuss in detail about different file access methods. 5

(b) What is disk scheduling? Compare various scheduling algorithms and sugest best algorithm for you own snapshot. 10

8. (a) What is a deadlock? Explain the necessary and sufficient condition for deadlock occurrence. 5

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(b) Consider the following snapshot of a system: 10

	Allocation			Maximum			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			

Answer the following questions using Bankers Algorithm:

(i) Is the system in a safe state?

(ii) Can request for (0, 2, 0) by P_0 be granted?

9. (a) What is Dining Philosophers problem? Discuss the solution to diving philosophers problem using monitors? 7½

(b) Define a semaphore? What is meant by counting semaphore and binary semaphore? Discuss mutual exclusion implementation using semaphore. 7½

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