

Roll No.

Total Pages : 3

018404

August/September 2022

B.Tech. (CSE(AIML)/CE/CSE/IT) IV SEMESTER
Operating System (PCC-CS-403)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) Define context switching. (1.5)
- (b) What is the function of kernel? (1.5)
- (c) Define interrupt. (1.5)
- (d) What is response time in CPU scheduling algorithm? (1.5)
- (e) Define thrashing. (1.5)
- (f) Explain test and swap hardware solution for critical section problem? (1.5)

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- (g) What do you mean by dirty bit?
- (h) What do you mean by swapping?
- (i) What are access permissions of files?
- (j) What is starvation?

PART-B

2. (a) What are different structures of Operating system? Explain them. (10)
- (b) What are different services offered by operating system for process creation? (5)
3. (a) Draw a 7-state process state diagram. (10)
- (b) What are different types of fragmentation? (5)
4. Consider the following set of processes, with the length of CPU burst in milliseconds:

PROCESS	P1	P2	P3	P4
ARRIVAL TIME	0	01	02	03
BURST TIME	9	5	3	4

Draw a Gantt chart that illustrates the execution of the processes using the FCFS, SJF and RR (time quantum = 2). Also find the average waiting time. (15)

5. (a) What are non-contiguous memory allocation schemes? Explain one in detail. (10)

(b) When do page fault occurs? What are the steps taken by OS to handle? (5)

6. Assume that there are 5 processes, P0 through P5, and 3 types of resources (A = 15, B = 8, C = 8). At time T0, we have the following system state:

	Allocation						Max			Available
	A	B	C	A	B	C	A	B	C	
P1	2	1	0	5	6	3	3	3	2	
P2	3	2	3	8	5	6				
P3	3	0	2	4	9	2				
P4	3	2	0	7	4	3				
P5	1	0	1	4	3	3				

Use the banker algorithm to test if the system is in a safe state or not? Also find the safe sequence. (15)

7. Write short note on the following :

(i) Disk Scheduling Algorithms.

(ii) Direct Memory Access.

(iii) Critical Section Problem.

(15)