Enrolment No. 102CTBMCS212208

NATIONAL FORENSIC SCIENCES UNIVERSITY, DELHI CAMPUS

B.Tech. - M.Tech. CS Integrated-Sem IV, February 2023

Term Assessment – 1

Subject Code: CTMTCSE SIV P4 **Date:**

Subject Name: Operating System **Time: 45 minutes**

Total Marks: 25

Instructions:

1. This Question Paper consists of 8 Questions.
2. All the questions are compulsory.

Section A (5 * 2M)

1. What are the functionalities of an OS?
2. Define an OS and mentions its goals.
3. What is context switching?
4. Which scheduler is responsible for controlling of degree of multiprogramming?
5. Mention the various states of a process.

Section B (3* 5M)

6. Illustrate with example and with suitable diagram all the types of operating system.
7. Consider the 3 processes, P1, P2 and P3 shown in the table.

Process	Arrival Time	Time Units Required
P1	0	5
P2	1	7
P3	3	4

   (a) Mention the completion order of the 3 processes under the policy of FCFS.
   (b) Find the average turn around time, average response time, average waiting time.
   (c) How much time the CPU is idle.
8. What is a PCB. Explain the roles and structure of PCB.

END OF PAPER

Enrolment No. 102CTBMCS21220038

NATIONAL FORENSIC SCIENCES UNIVERSITY, DELHI CAMPUS
B. Tech. - M. Tech. CS Integrated-Sem IV, April 2023
Mid Semester Examination

Subject Code: CTBTCSE SIV P4
Subject Name: Operating Systems

Date: 20/04/2023
Time: 1 Hr 30 Min
Total Marks: 50

Instructions:
1. This Question Paper consists of 6 Questions.
2. All the questions are compulsory.

Section A (2 * 5 Mark)

1. What is an address space? Explain in detail with example various types of Address space.
2. Explain with example how security and protection mechanism is achieved by operating systems.

Section B

3. (a). Discuss a suitable solution to achieve synchronisation requirements for producer and consumer problem. **(4 Mark)**
   (b). Explain why implementing synchronization primitives by disabling interrupts is not appropriate in a single-processor system if the synchronization primitives are to be used in user-level programs. **(4 Mark)**
4. (a). Compare and contrast multicore programming and multithreading models with example. **(4 Mark)**
   (b). Do you think Locking mechanism is a suitable solution to synchronisation problem, explain. **(4 Mark)**
5. The following processes are being scheduled using a pre-emptive, round-robin scheduling algorithm. Each process is assigned a numerical priority, with a higher number indicating a higher relative priority. In addition to the processes listed below, the system also has an idle task (which consumes no CPU resources and is identified as P_{idle}). This task has priority 0 and is scheduled whenever the system has no other available processes to run. The length of a time quantum is 10 units. If a process is pre-empted by a higher-priority process, the pre-empted process is placed at the end of the queue.

Thread	P1	P2	P3	P4	P5	P6
Priority	40	30	30	35	5	10
Burst	20	25	25	15	10	10
Arrival	0	25	30	60	100	105

   Show the scheduling order of the processes using a Gantt chart. **(8 Mark)**

6. (a). Consider the following set of jobs. What would be the average waiting time if pre-emptive shortest remaining time first algorithm is used; Also, find all the Scheduling parameter using SJF algorithm. **(5 Mark + 7 Mark)**

Process_Id	A	B	C	D	E	F
Duration	12	7	2	5	2	12
Arrival_Time	0	3	6	8	9	12

   (b). Compare and contrast Linker and loader with example. **(4 Mark)**

Seat No.: 7277 Enrolment No. 102CTBCS212203O

NATIONAL FORENSIC SCIENCES UNIVERSITY

B.Tech-M.Tech CSE (CS) - Semester - IV - July-2023

Subject Code: CTBTCSE SIV P4 **Date: 06/07/2023**

Subject Name: Operating System

Time: 11:00 AM to 2:00 PM **Total Marks: 100**

Instructions:

1. **Write down each question on a separate page.**
2. **Figures to the right indicate full marks.**

		Marks
Q.1	**Attempt Any 3 Questions (8 Marks each)**	**24**
(a)	What is Process Management? Explain Process Control Block in detail.	
(b)	List all types of Operating System. Explain any two in details.	
(c)	What is Page Fault? Explain Steps to handle the page fault.	
(d)	What is Main Memory? Explain Contiguous Memory Allocation	
Q.2	**Attempt Any 3 Questions (8 Marks each)**	**24**
(a)	What is Thread? Explain Multithreading models in details.	
(b)	What is Linker and Loader? Explain it with flow chart.	
(c)	What is System Calls? Explain types of System Calls.	
(d)	Consider the reference string 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 and Page Frame is 3. Calculate the no of page fault using FIFO page replacement algorithm.	
Q.3	**Attempt Any 3 Questions (8 Marks each)**	**24**
(a)	What is Deadlock? Explain the characterization of deadlock and explain methods of handling deadlock.	
(b)	What are the classic problems of synchronization. Explain Producer Consumer Problem with example.	
(c)	Consider the set of 3 processes P1, P2, P3 and burst time is 24, 3, 3 respectively. Calculate the average waiting time using Round Robin with time quantum = 4.	
(d)	What is Address Space? Differentiate Physical Address Vs Logical Address.	
Q.4	**Attempt Any 2 Questions (7 Marks each)**	**14**
(a)	Differentiate Paging Vs Segmentation	
(b)	What is RAID? Explain Different RAID Levels with diagram.	
(c)	Explain how to build and boot an Operating System	
Q.5	**Attempt Any 2 Questions (7 Marks each)**	**14**
(a)	What is Operating System Security? Explain Authentication, OTP, Program Threats and System Threats	
(b)	What is Virtual Memory? Explain Demand Paging with steps advantage and disadvantage.	
(c)	List all Thread Libraries. Explain any one in details with example.	

END OF PAPER