Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2021

Subject Code:3141601   **Date:31/12/2021**
Subject Name:Operating System and Virtualization
Time:10:30 AM TO 01:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Differentiate between Multi-Programming and Multi-Processing System.	**03**
	(b)	Write different types of system calls?	**04**
	(c)	What is scheduler? Explain queuing diagram representation of process scheduler.	**07**
Q.2	**(a)**	Explain Fragmentation.	**03**
	(b)	Define the following terms.	**04**

       1. Throughput
       2. Waiting Time
       3. Turnaround Time
       4. Response Time

    (c) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds: **07**

Process	burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

For each of the scheduling algorithms, FCFS, Shortest-Job-First (SJF, nonpreemptive), Priority (smaller priority number implies higher scheduling priority), and RR (quantum = 1) do the following:

    a. Draw a Gantt chart to show how these processes would be scheduled.
    b. Give the turnaround time (total time from first arrival into ready state until cpu-burst is completed) of each process.
    c. Give the waiting time (total time spent in the Ready state) of each process.
    d. Give the average waiting time of all the processes.

Which of these scheduling algorithm gives the smallest average waiting Time?

OR

    (c) What is Process? Draw Five State Process Model and Explain it. **07**

Q.3	**(a)**	Give the functions of following UNIX commands:
		   1. grep
		   2. cat
		   3. cmp
			03

	(b)	Explain concept of Demand Paging in memory management.	**04**
	(c)	What is Critical Section Problem and list the requirements to solve it. Write Peterson's Solution for the same.	**07**

OR

Q.3	**(a)**	What is deadlock? List the conditions that lead to deadlock.	**03**
	(b)	Explain Hypervisor.	**04**
	(c)	Explain Dining-philosophers Solution Using Monitors.	**07**

Q.4	**(a)**	What is interrupt? How it is handle by operating system.	**03**
	(b)	What is device driver? Explain its function in brief.	**04**
	(c)	Explain VMware ESXi architecture.	**07**

OR

Q.4	**(a)**	What is called TLB?	**03**
	(b)	Describe RAID level 4.	**04**
	(c)	Explain the events that cause processes to be created.	**07**

Q.5	**(a)**	Write about Resource Allocation Graph algorithm.	**03**
	(b)	Write benefits of Virtual Machines.	**04**
	(c)	Write Banker's Algorithm.	**07**

OR

Q.5	**(a)**	Define following Terms:
		   1. Mutual Exclusion
		   2. Thrashing
		   3. Thread
			03

	(b)	List Deadlock Recovery Techniques and explain one of them.	**04**
	(c)	What is Semaphore? Give the implementation of Bounded Buffer.	**07**

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