Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 140702 **Date: 08/06/2017**

Subject Name: Operating System

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.**

Q.1 **(a)** (I) Define: Critical Section, Race Condition. **01**

(II) Give the role of "Kernel" and "Shell" in UNIX. **02**

(III) What is thread? Explain thread structure. **04**

(b) (I) What is Operating System? Give functions of Operating System. **04**

(II) Give the functions of following UNIX commands: grep, cat, chmod **03**

Q.2 **(a)** Explain the use of Banker's Algorithm for Deadlock Avoidance with Example. **07**

(b) Explain IPC Problem –Dining Philosopher Problem. **07**

OR

(b) What is Semaphore? Give the implementation of Producers-Consumers problem using Semaphore. **07**

Q.3 **(a)** What is Scheduler? Explain Long term, Medium term and Short term scheduler in detail. **07**

(b) Consider the following set of processes with the length of the CPU-burst time and Arrival time given in millisecond. **07**

Process	**Arrival Time**	**Burst Time**
P1	0	4
P2	1	3
P3	2	1
P4	3	2
P5	4	5

Apply First Come First Serve process scheduling algorithm and calculate the following

(I) Turn around Time for all processes and average turn around time.

(II) Waiting time for each processes and average waiting time.

OR

Q.3 **(a)** What is deadlock? List the conditions that lead to deadlock. How deadlock can be prevented? **07**

(b) Consider the following set of processes with the length of the CPU-burst time and Arrival time given in millisecond. **07**

Process	**Arrival Time**	**Burst Time**
P1	1	7
P2	2	5
P3	3	1
P4	4	2
P5	5	8

Apply First Shortest Job First(Non-preemptive) process scheduling algorithm and calculate the following

(I) Turn around Time for all processes and average turn around time.

(II) Waiting time for each processes and average waiting time.

Q.4	**(a)**	What is Virtual Memory? Explain Demand Paging.	**07**
	(b)	Explain the following allocation algorithms: 1) First-fit 2) Best-fit 3) Worst-fit.	**07**
		OR	
Q.4	**(a)**	What is fragmentation? What is the need of fragmentation? Explain the difference between internal and external fragmentation.	**07**
	(b)	Explain various Page Replacement Algorithms with example.	**07**
Q.5	**(a)**	Write a short note on: 1) Direct memory access(DMA), 2) Device controllers	**07**
	(b)	Write a short note on multiprocessor and Distributed Operating System.	**07**
		OR	
Q.5	**(a)**	Explain First Come First Serve and Shortest Seek Time First Disk Scheduling algorithms with example.	**07**
	(b)	Explain any two File Allocation Methods from the following: (I) Contiguous Allocation (II) Linked Allocation (III) Indexed Allocation	**07**

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