Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 140702 Date: 23-06-2014

Subject Name: Operating System

Time: 10:30 am - 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)** Explain the objectives and functions of operating systems. **07**

(b) Define a process. Explain the process state transition with a neat diagram. **07**

Q.2 **(a)** What is thread and what are the differences between user-level threads and kernel supported threads? Under what circumstances is one type "better" than the other? **07**

(b) Explain the Problem of Critical Section (CSP) through Producer Consumer Problem. Explain any one Solution in detail. **07**

OR

(b) Write short note: 1) Semaphores 2) Monitors **07**

Q.3 **(a)** Find average waiting time for Shortest job first scheduling, and Round robin scheduling algorithm. **07**

Process	CPU burst time
P1	6
P2	8
P3	5
P4	2

CPU burst time is given in millisecond and time quantum is 4.

(b) What do you mean by Deadlock Avoidance? Explain the use of Banker's Algorithm for Deadlock Avoidance with illustration. **07**

OR

Q.3 **(a)** Consider the following set of processes with the length of CPU burst time given in the milliseconds. **07**

Process	Arrival Time	Burst time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

Calculate average turnaround time and average waiting time for First-come first served scheduling, Shortest job first scheduling and Priority scheduling algorithm.

(b) What is Deadlock? **07**

List the conditions that lead to deadlock. How Deadlock can be prevented?

Q.4 **(a)** Explain the following allocation algorithms: 1) First-fit 2) Best-fit 3) Worst-fit **07**

(b) Write short note: 1) Direct memory access (DMA) 2) Device controllers **07**

OR

Q.4 **(a)** What is fragmentation? What is the need of fragmentation? Explain the difference between internal and external fragmentation. **07**

(b) Write short note: RAID levels **07**

Q.5 **(a)** Explain in details about file attributes and file operations. **07**

(b) What is "inode"? Explain File and Directory Management of Unix Operating System. **07**

OR

Q.5 **(a)** Describe various file organization techniques. **07**

(b) Define distributed system. Explain the characteristics of distributed system. **07**

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