

**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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