

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**

<u>Process</u>	<u>Arrival Time</u>	<u>Burst Time</u>
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**

<u>Process</u>	<u>Arrival Time</u>	<u>Burst Time</u>
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: **07**
 (I) Contiguous Allocation
 (II) Linked Allocation
 (III) Indexed Allocation
