

2062  
B.E. (Information Technology)  
Fourth Semester  
PCIT-403: Operating System

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

1. Define the followings: (10)
- Real Time operating system
  - TLB
  - Stateful Server
  - Belady's Anomaly
  - Free Space Management

**PART - A**

2. a) What is critical section problem? How are semaphores help in handling this problem? Explain with the help of example. (6)  
b) Define process control block with diagram. (4)
3. a) Differentiate between external and internal fragmentation with suitable example. (4)  
b) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. (6)
- How many bits are there in the logical addresses?
  - How many bits are there in the physical addresses?
  - If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?
4. Consider the following sequence of logical addresses from a 600 byte programme:  
20, 45, 107, 234, 450, 123, 309, 245, 560, 558, 364.

Assuming a page size of 50 bytes. Give the reference string and how many page faults would occur using LRU and Optimal replacement algorithms if 150 bytes of physical memory is available? (10)

**PART - B**

5. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The current head position is at cylinder 143. The queue of pending requests is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. What is the total distance that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms: (10)
- SSTF
  - SCAN
6. Discuss in detail the deadlock detection and recovery techniques for distributed environment with example. (10)
7. Write short note on any two of the followings: (10)
- Process Migration
  - Bully Election Algorithm
  - Unix file system

x-x-x