PAPER ID-411519

Roll No:

BTECH
(SEM IV) THEORY EXAMINATION 2023-24
OPERATING SYSTEM

TIME: 3 HRS   **M.MARKS: 70**

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.**   **2 x 7 = 14**

a.	What is the primary function of an operating system?
b.	Define a batch processing system?
c.	Define the principle of concurrency?
d.	Define a process state?
e.	Name one piece of process identification information?
f.	Define a resident monitor?
g.	Define an I/O subsystem?

SECTION B

2. **Attempt any *three* of the following:**   **7 x 3 = 21**

a.	Compare and contrast time-sharing and multiprogramming operating system concepts?
b.	Explain the challenges of achieving mutual exclusion in concurrent programming?
c.	Explain the structure and contents of a Process Control Block (PCB)?
d.	Compare and contrast multiprogramming with fixed partitions and variable partitions?
e.	Compare and contrast different disk storage technologies, such as HDDs and SSDs?

SECTION C

3. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | How does a multiuser operating system differ from a multiprocessing system? |
| (b) | Explain the structure and components of an operating system with a layered architecture? |

4. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | Explore the concept of deadlock and how it can occur in concurrent systems, discussing prevention and avoidance techniques? |
| (b) | Compare and contrast Dekker's and Peterson's algorithms for mutual exclusion, considering their advantages and limitation? |

5. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | Evaluate strategies for deadlock prevention, avoidance, detection, and recovery in concurrent systems, highlighting their effectiveness and trade-offs? |
| (b) | Define deadlock in operating systems, discussing the system model and conditions necessary for deadlock occurrence? |

6. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | Explain the principles of paging and segmentation as memory management techniques, comparing their suitability for different system architectures? |
| (b) | Discuss virtual memory concepts, including address translation, page tables, and demand paging mechanisms? |

7. **Attempt any *one* part of the following:**   **7 x 1 = 7**

| (a) | Discuss the organization of files within file systems, including contiguous, linked, and indexed allocation methods? |
| (b) | Explain the structure and management of file directories, including hierarchical and flat directory structures? |