PAPER ID-411519

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Subject Code: BCS401

Roll No: 2200560100026

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?

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