

22516

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following:** **10**
- a) State and describe any two advantages of multiprocessor system.
 - b) State any four types of system calls.
 - c) Draw a neat labelled diagram for process state.
 - d) State difference between preemptive scheduling and non-preemptive scheduling.
 - e) Define the term fragmentation in terms of memory.
 - f) Give commands to perform following tasks:
 - i) To add delay in script
 - ii) To terminate a process
 - g) List any four operations performed on a file.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Describe working of time sharing system with neat diagram.
 - b) List and describe any four services of operating system.
 - c) Differentiate between shared memory system and message passing system of interprocess communication.
 - d) State and describe any two scheduling criteria.
- 3. Attempt any THREE of the following:** **12**
- a) Describe use of ps and wait commands with suitable example.
 - b) Describe prevention of deadlock occurrence with respect to hold and wait necessary condition.
 - c) With suitable diagram, describe the concept of variable partitioning of memory.
 - d) Describe linked file allocation method with suitable example. Also list its one advantage.
- 4. Attempt any THREE of the following:** **12**
- a) Differentiate between command line based operating system and GUI based operating system (Any four points)
 - b) Describe various activities performed by following operating system components.
 - i) Main memory management
 - ii) File management
 - c) With suitable diagram, describe use of scheduling queues in process scheduling.
 - d) Write steps required for Banker's algorithm to avoid deadlock.
 - e) With suitable example, describe any one free space management technique.

5. Attempt any TWO of the following:**12**

- a) Calculate average waiting time for following data using First Come First Served (FCFS) and Shortest Job First (SJF) algorithms.

Process	Burst time	Arrival time
P0	08	0
P1	04	1
P2	05	2
P3	03	3

- b) Describe with example, use of following tools:
- Device Management
 - Performance monitor
 - Task scheduler
- c) Describe the concept of virtual memory with respect to paging. Also draw paging hardware diagram and describe its working with example.

6. Attempt any TWO of the following:**12**

- a) Describe one-to-one multithreading model with suitable diagram. Also write any two advantages of one-to-one model over many-to-one model.
- b) Consider the following page reference string arrival with three page frames:-
5, 6, 7, 8, 9, 7, 8, 5, 9, 7, 8, 7, 9, 6, 5, 6
Calculate number of page faults with optimal and FIFO (First In First Out) page replacement algorithms.
- c) Describe following directory structures in short with neat sketches:
- Single level
 - Two level
 - Tree structured
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