

22516

23124

3 Hours / 70 Marks

Seat No.

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- 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) Define real time operating system, along with any two applications of it.
 - b) List any four services provided by operating system.
 - c) Draw neat labelled process state diagram along with the correct directions of arrows.
 - d) Define CPU bound program and I/O bound program.
 - e) Define paging and segmentation.
 - f) What is the use of PS command? Write long forms of UID, PID in the output of this command.
 - g) List any four file operations.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Describe multiprocessor OS with its advantages (any two).
- b) Write down the responsibilities of the following components of OS.
 - i) Memory management
 - ii) File management
- c) Explain shared memory method of IPC using neat labelled diagram.
- d) Explain following terms with respect to scheduling
 - i) CPU utilization
 - ii) Throughput
 - iii) Turnaround time
 - iv) Waiting time

3. Attempt any THREE of the following: 12

- a) Explain following commands with their syntax –
 - i) Kill
 - ii) Sleep
 - iii) Wait
 - iv) Exit
- b) What is deadlock? Discuss any one method of deadlock prevention.
- c) Describe concept of free space management technique using bit map method.
- d) Draw the diagram of linked file allocation method and explain it.

4. Attempt any THREE of the following:**12**

- Compare between CLI based OS and GUI based OS (any four points).
- What are the different types of system calls? Give examples of each.
- Explain working of CPU switch from process to process with neat labelled diagram.
- Solve given problem by using FCFS scheduling algorithm. Draw correct Gantt chart and calculate average waiting time and average turnaround time –

Process	Arrival time	Burst time
P0	0	10
P1	1	29
P2	2	3
P3	3	7
P4	4	12

- Which hole is taken for next segment request for 8 KB in a swapping system for First fit, Best fit and Worst fit.

OS
4 KB
9 KB
20 KB
16 KB
8 KB
2 KB
6 KB

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

- a) Write two uses of the following operating system tools –
- i) Security policy
 - ii) User management
 - iii) Performance Monitor
- b) Differentiate between process and thread (any two points). Also discuss the benefits of multithreaded programming.
- c) Find out the total number of page faults using –
- i) Least recently used page replacement
 - ii) Optimal page replacement

Page replacement algorithms of memory management, if the page are coming in the order

7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

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

- a) How pre-emptive scheduling is better than non pre-emptive scheduling by solving following problem using SJF (Solve it by using pre-emptive SJF and non-pre-emptive SJF also).

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

- b) List free space management technique with the help of neat diagram, explain any one technique in detail.
- c) Draw and explain directory structure of a file system in terms of single level, two level and tree structure.
