22516

23124

3 Hours / 70 Marks Seat No. | | | | | | | | |

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.

Marks

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

a) Describe multiprocessor OS with it's 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.

Marks

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

a) Compare between CLI based OS and GUI based OS (any four points).

b) What are the different types of system calls? Give examples of each.

c) Explain working of CPU switch from process to process with neat labelled diagram.

d) 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

e) 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

Marks

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.