



Operating Systems (1080)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any two** questions From each unit.
5. Figures to the right indicate full marks.
6. Draw a suitable diagram wherever necessary.
7. Assume suitable data wherever necessary.

UNIT - I

1. a) i) Define operating system ? List the various services provided by operating system. 5
ii) Compare between process and Thread. 5
b) i) Explain process concept ? Draw process state transition diagram and explain the various process states. 5
ii) What is spooling ? Explain its working with necessary diagram. 5
c) i) Explain any five components of operating system in brief. 5
ii) What is thread ? Explain advantages of threading. 5

UNIT - II

2. a) Consider the following set of process with the length of CPU burst time in milliseconds. 10

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

All Processes are assumed to have arrived in the order P1, P2, P3, P4 and all at time 0.

Draw Gantt chart and calculate average waiting time and average turnaround time using following scheduling algorithm.

- i) Non Preemptive SJF ii) Preemptive SJF.

- b) i) Explain semaphores in brief. 5

- ii) For the following processes, draw a Gantt chart illustrating their execution using following scheduling algorithm. 5

i) Priority (preemptive) ii) Priority (Non preemptive)
Also find waiting time, Average waiting time & Turnaround time, average turnaround time for each process using above scheduling algorithm.

Process	Arrival Time	Burst Time	Priority
P1	0	7	3
P2	1	1	1
P3	2	3	2
P4	3	4	4

- c) i) Explain MLQ scheduling without feedback. 5

- ii) What is IPC ? Explain any one method of IPC in brief. 5

UNIT - III

3. a) i) Describe in brief various ways for dead lock prevention. 5
ii) Explain first fit, Best fit and worst fit memory allocation strategies. 5

- b) i) Explain the following system call in brief. 5
i) Fork ii) Exec

- ii) What is segmentation ? Explain segmentation hardware with neat sketch. 5

- c) Consider a system with 5 process P₀ - P₄ and three resources A, B, C given that. 10

Resource Type A has 10 instances

Resource Type B has 5 instances

Resource Type C has 7 instances

The following Snapshot of the system has been taken.

Process	Current Allocation			Max Need		
	R1	R2	R3	R1	R2	R3
P ₀	0	1	0	7	5	3
P ₁	2	0	0	3	2	2
P ₂	3	0	2	9	0	2
P ₃	2	1	1	2	2	2
P ₄	0	0	2	4	3	3

Answer the following using Banker's Algorithm.

- i) Find the matrix of available resources.
ii) What is the content of the matrix need.
iii) Find the safe sequence.

UNIT - IV

4. a) i) What is File ? Explain the attributes of file. 5
- ii) Compare viruses and worms. 5
- b) i) Explain demand paging in brief ? What are the drawbacks of demand paging ? 5
- ii) What are various disk allocation strategies ? Explain any one in brief. 5
- c) i) What is thrashing ? Discuss solution for it. 5
- ii) Consider the following page reference string 2, 3, 2, 1, 5, 2, 4, 5, 3, 2, 5, 2. How many page fault occur. If there is three page frames are available to it using.
- i) FIFO Replacement
- ii) LRU Replacement
- iii) Optimal Replacement. 5

UNIT - V

5. a) i) What is inode ? Explain disks inode in detail. 5
- ii) Explain any three system calls in Unix. 5
- b) i) Define distributed operating system ? Give major reasons for why distributed operating system is built. 5
- ii) What is super block ? Write the fields of it. 5
- c) Write short notes on the following using disks scheduling algorithm 10
- i) SSTF
- ii) SCAN
