Total No of Questions: [12] *SEAT NO. :*

[Total No. of Pages : 3]

T.E. IT (Semester I)

Operating System

2008 Course

Time: 3 Hours ***Max. Marks : 100***

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right side indicate full marks.*
4) *Use of Calculator is allowed.*
5) *Assume Suitable data if necessary*

SECTION I

Q1) a) Describe the Operating System as a control program [6]

b) Explain the concept of virtual machine with its implementation and benefits. Also explain example of virtual machine? [8]

c) Explain following commands of Linux with minimum two options [4]

i) grep
ii) cut

OR

Q2) a) Explain the following operating systems. [6]

(a) Real-time system

(b) Distributed system

(c) Handheld system

b) Draw and Explain the architecture of windows 2000 [8]

c) Explain command line arguments in shell with example [4]

Q3) a) Draw and explain process state transition diagram for Unix Operating system . [8]

b) What is granularity in multiprocessor scheduling? Discuss the design issues for multiprocessor scheduling [8]

OR

Q4) a) Explain the concept of thread with neat diagram. Compare User Level Thread and Kernel Level Thread [8]

b) Consider the following set of processes with the length of CPU burst time given in milliseconds [8]

Process	Arrival time	Burst time

P1	0	6
P2	1	4
P3	3	5
P4	5	3

Draw the Gantt charts illustrating the execution of these processes using SJF(pre-emptive and non pre-emptive) and FCFS. Calculate average Turnaround time, average waiting time in each case.

Q5) a) Explain the different IPC mechanisms [8]

b) What is busy waiting with respect to process synchronization? Explain how semaphore solves problem of synchronization. [8]

OR

Q6) a) Write and explain the Banker's algorithm for deadlock avoidance. [8]

b) Describe various hardware approaches to achieve mutual exclusion. [8]

SECTION II

Q7) a) Consider the following table [6]

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses?

1) 0,430 2) 1, 10 3) 2, 500 4) 3,400 5) 4,112 6) 3.600

b) What is Virtual memory? How it is implemented with demand paging? [8]

c) A process references pages in the following order [4]

2 3 2 1 5 2 4 5 3 2 5 2

Using FIFO calculate number of page faults (No. of Frames=3)

OR

Q8) a) Explain contiguous memory allocation scheme in detail [8]

b) Explain the following terms [10]

i. Thrashing

ii. Compaction

iii. Principle of locality

Q9) a) How Unix File system is different than Windows file system? Explain Unix File System in details [8]

b) A disk drive has 640 cylinders, numbered 0-639. The drive is currently serving the request at cylinder 200. The queue of pending requests in FIFO order is: 184, 153, 232, 128, 25, 533, 161, and 169. Starting from the current head position what is the total distance that the disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms i) FCFS ii)SCAN [8]

OR

Q 10) a) Write short note on [8]

a. I/O buffering
b. File sharing

b) Explain file system free space management techniques. [8]

Q 11) a) Explain the Protection domain in detail [8]

b) Write short note on [8]

i. Authentication
ii. Trusted systems

OR

Q 12) a) What are different intrusion detection techniques? [8]

b) Describe program threats and system threats [8]