Total No. of Questions : 6]

SEAT No. :

P4903

[Total No. of Pages : 3

[4958]-204

T.E. I.T.

OPERATING SYSTEM

(2008 Pattern)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to right indicate full marks.***

SECTION - I

Q1) a) What is Operating System? What are objectives and functions of Operating System? **[8]**

b) What is system call? Explain its significance? **[4]**

c) Differentiate between monolithic and Microkernel. **[4]**

OR

a) Describe evolution of Operating System in detail with its advantages and disadvantages. **[8]**

b) What is virtual machine? Explain concept of virtualization in detail with neat diagram. **[8]**

Q2) a) What is meant by Process Control Block? Draw and explain different fields of PCB. Explain Context Switch by giving an example. **[10]**

b) Explain in detail real time scheduling concept of Operating system. **[6]**

OR

a) Consider following set of processes. **[12]**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

P.T.O.

Processes are arrived in the order of P1, P2, P3, P4, P5, all at same time 0.

i) Draw Gantt Chart to show the execution using FCFS, SJF, Non-preemptive priority (Smaller priority number implies higher priority).

ii) What are Turnaround time and waiting time of each process for each scheduling Algorithm in part a.

b) Differentiate between user level thread and kernel level thread. **[4]**

Q3) a) What is mutual exclusion? List and explain requirements of mutual exclusion. **[8]**

b) Consider following snapshot of system. **[10]**

Process	Allocation			Max			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

Answer the following questions using bankers algorithm.

i) What is the content of need matrix?

ii) Is the system is in safe state? What is safe sequence?

OR

a) What is deadlock? What is difference among deadlock avoidance, detection and prevention? **[8]**

b) Write process structure of reader and writer using semaphore and explain. **[6]**

c) Explain concept of monitor with neat diagram. **[4]**

SECTION - II

Q4) a) What is fragmentation? Explain internal and external fragmentation in detail with suitable example. Also explain compaction technique. **[10]**

b) Explain with the help of neat diagram Buddy system of memory management. **[8]**

OR

a) A process contains following virtual pages on disk and is assigned a fixed allocation of three frames in main memory. Show successive pages residing in the three frames using FIFO, LRU and Optimal. **[10]**

Reference string : 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

b) Describe the following term in brief : **[8]**

i) Principle of locality

ii) Thrashing

iii) Belady's anomaly

iv) Working Set Model

Q5) a) Describe any two types of File organization with example. **[8]**

b) What are the different buffering ways in I/O buffering? **[8]**

OR

a) What is RAID? Explain the advantages and disadvantages of RAID. Also explain seven RAID levels in brief. **[8]**

b) Describe the following term : **[8]**

i) Directory Structure

ii) File Sharing

Q6) a) What is the difference between passive and active security threats? **[8]**

b) Write security mechanisms in Unix and Windows. **[8]**

OR

a) Explain with the diagram the taxonomy of malicious programs. **[8]**

b) Explain techniques and security policies to improve the resistance to threats. **[8]**