

Nirma University
Institute of Diploma Studies
Semester End Examination (IR/RPR), November - 2009
Diploma in Information Technology, Semester- V
ICEB03 - MODERN OPERATING SYSTEM SOFTWARE

Roll /
Exam No.

Supervisor's initial
with date

Time: 3 Hours

Max. Marks: 100

- Instructions:
1. Attempt all questions.
 2. Figures to right indicate full marks.
 3. Section wise separate answer book to be used
 4. Draw neat sketches wherever necessary.

SECTION-I

Q-1 A. Do as directed.

(10)

1. What are the functions of an operating system?
2. Define: Hard Real Time OS.
3. What are the benefits of layered approach of operating system structure?
4. Which scheduler select the process from the ready queue and allocates CPU to that process?
5. Define: Turnaround time.
6. What is tightly coupled system?
7. What is relative path in tree structured directories?
8. What is graceful degradation?
9. What is Super block in file system?
10. SRT scheduling algorithm is a preemptive algorithm (True/False). Justify your answer.

B. Describe task control block with the help of diagram.

(04)

Q-2 A. Answer the following.(Any Two)

(06)

1. Discuss many to one multithreading model.
2. Write a short note on microkernel.
3. Explain in detail the various file operations.

B. Answer the following.(Any Three)

(12)

1. Describe the indexed allocation of file allocation with its merits and demerits.
2. Define file and explain acyclic graph directory structure.
3. Define following terms in respect to interprocess communication.
 - (a) Direct Communication
 - (b) Indirect Communication
4. List various operating system services and explain any three in detail.

Q-3 A. Do as directed.

1. Consider following processes, with the CPU burst time given in (06) milliseconds.

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

Draw Gantt chart and compute the average turn around time and average waiting time for the following algorithms.

1. Preemptive SJF
2. Nonpreemptive SJF

OR

1. Consider following processes, with the CPU burst time given in (06) milliseconds.

Process	Burst Time	Arrival Time	Priority
P1	5	1	1
P2	4	0	3
P3	6	2	4

Draw Gantt chart and compute the average turn around time and average waiting time for the following algorithms.

1. Preemptive Priority
 2. Nonpreemptive Priority
2. Consider following processes, with the CPU burst time given in (06) milliseconds.

Process	Burst Time	Arrival Time
P1	9	2
P2	6	1
P3	3	0

Draw Gantt chart and compute the average turn around time and average waiting time for the following algorithms.

1. RR scheduling algorithm. (Choose Time slice = 1 millisecond).
2. FCFS scheduling algorithm.

B. Answer the following.

(06)

1. State various file access methods and explain any one in detail.
2. Discuss context switching with the help of diagram.

SECTION-II

(04)

Q-4 A. Do as Directed.(Any Four)

1. What is logical address?
2. What is Compile time binding?
3. The run time mapping from virtual to physical address is done by a hardware device called the _____. (MMU, DMA)
4. What is lazy swapper?
5. _____ Layer virtualizes hardware interfaces, making the hardware dependencies transparent to the rest of the operating system in Windows NT. (Hardware abstraction, executive)

B. Answer the following.(Any five) (10)

1. List any four Windows NT design goals:
2. If page size is 2048 bytes and a process size is 72,766 bytes then find out total pages needed by process.
3. Give the difference between maskable and non-maskable interrupt.
4. What is spooling?
5. Justify "Paging slowdown speed by factor of 2".
6. What is Virtual Memory?

C. Describe TLB in detail. (04)**Q-5 A. Answer the following. (Any Two) (06)**

1. Write down steps for handshaking notion between the host and the controller in polling.
2. Explain inverted page table structure with an appropriate diagram.
3. Discuss DMA controller.
4. List characteristic of NTFS file system.

B. Answer the following.(Any one) (08)

1. Explain buffering and caching in kernel I/O subsystem.
2. What is paging? Explain page replacement approach with an appropriate diagram.

C. Answer the following. (06)

1. Explain segmentation in detail.
2. Explain difference between internal fragmentation and external fragmentation in detail.

Q-6 Answer the following. (12)

1. Consider the following memory reference string
1,2,3,4,1,2,5,1,2,3,4,5
How many page faults would occur for the following page replacement algorithm assuming three frames which are initially empty?
(a) Optimal
(b) FIFO
2. For a given memory partitions of 100k, 500k, 200k, 300k and 600k (in order), place the process of 212k, 417k, 112k and 426k (in order) for the following algorithm using diagram:
(a) Best fit
(b) Worst Fit
(c) First fit
Which algorithm makes the most efficient use of memory?
3. The time required to access TLB is 26ns and to access primary memory is 100ns. If the hit ratio is 35% then find out effective memory access time and miss ratio.