

Register No:

B.E DEGREE EXAMINATIONS: APRIL / MAY 2011

Fourth Semester

COMPUTER SCIENCE AND ENGINEERING

U07CS403: Operating Systems

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:

PART A (10 x 1 = 10 Marks)

1. The process related to process control, file management, device management, information about system and communication that is requested by any higher level language can be performed by _____.
a) Editors b) Compilers c) System Call d) Caching
2. Multiprogramming systems _____.
a) Are easier to develop than single programming systems
b) Execute each job faster
c) Execute more jobs in the same time
d) Are used only on large main frame computers
3. Round robin scheduling is essentially the preemptive version of _____.
a) FIFO b) Shortest job first c) Shortest remaining job d) Longest time first
4. The solution to Critical Section Problem is : Mutual Exclusion, Progress and Bounded Waiting.
a) The statement is false b) The statement is true.
c) The statement is contradictory. d) Partially correct.
5. Let S and Q be two semaphores initialized to 1, where P0 and P1 processes the following statements wait(S);wait(Q); ---; signal(S);signal(Q) and wait(Q); wait(S);--- signal(Q);signal(S); respectively. The above situation depicts a _____.
a) Semaphore b) Deadlock c) Signal d) Interrupt
6. The mechanism that brings a page into memory only when it is needed is called as
a) Segmentation b) Fragmentation c) Demand Paging d) Page Replacement
7. A page fault occurs
a) when the page is not in the memory b) When the page is in the memory
c) When the process enters the blocked state d) when the process is in the ready state

8. Virtual memory is _____.
- a) An extremely large main memory
 - b) An extremely large secondary memory
 - c) An illusion of extremely large main memory
 - d) A type of memory used in super computers.
9. Which directory implementation is used in most Operating System?
- a) Single level directory structure
 - b) Two level directory structure
 - c) Tree directory structure
 - d) Acyclic directory structure
10. A tree structured file directory system
- a) allows easy storage and retrieval of file names
 - b) is a much debated unnecessary feature
 - c) is not essential when we have millions of files
 - d) Not required by OS

PART B (10 x 2 = 20 Marks)

11. Write is the concept of timesharing operating systems?
12. What is Dispatcher?
13. What is starvation and aging?
14. What is Context Switch?
15. Write the deadlock prevention techniques?
16. Why paging is used?
17. Differentiate Logical and Physical Address Space?
18. What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem?
19. List the difference between Primary storage and secondary storage?
20. List the responsibilities of the operating system in connection with disk management.

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain the concepts of multiprogramming, multiprocessing, and real time operating systems. (7)
- (ii) State the purpose of short-term, medium term and long-term schedulers. Also discuss the difference among them. (7)
- [OR]**
- b) Discuss about the inter process communication.
22. a) Consider the following five processes, with the length of the CPU burst time given in milliseconds.

Process	Burst time
P1	10
P2	29
P3	3
P4	7
P5	12

Consider the FIFO, Non-preemptive shortest job first (SJF), Round robin (RR) with time quantum = 10 milliseconds scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithms will give the minimum average waiting time? Discuss.

[OR]

b) Discuss the critical section problem. Solve the Readers-Writers problem using Semaphores.

23. a) Consider the following snapshot of a system. Execute Banker's algorithm to answer the following.

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	2	0	1	2	2	0	1	2	2	4	2	1
P1	1	0	0	0	2	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	7	5	2				
P4	0	0	1	4	0	7	5	6				

(i) Is the system in safe state? if the system is safe, show how all the process could complete their execution successfully. If the system is unsafe, show how deadlock might occur. Explain.

(ii) If a request process P1 arrives (1, 4, 2, 0) can the request be granted?

[OR]

b) (i) Distinguish the difference between paging and segmentation. (7)

(ii) Define the deadlock problem. Explain in detail the prevention and recovery methods of deadlock. (7)

24. a) Explain the page replacement algorithms in detail.

[OR]

b) Explain about Indexed allocation and Linked allocation methods.

25. a) Suppose that a disk drive has 5000 cylinders. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending request is:

86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

What is the distance to satisfy these requests using the following algorithms?

FCFS, SSTF, LOOK, C-LOOK, C-SCAN, SCAN.

[OR]

b) Explain the I/O system and process management in Linux Operating System.
