Code No: R31056

R10

Set No: 1

III B.Tech. I Semester Regular Examinations, November/December - 2012
OPERATING SYSTEMS
(Common to Computer Science and Engineering & Information Technology)

Time: 3 Hours   **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Distinguish between the client-server and peer-to-peer models of distributed systems.
   (b) Explain briefly system calls and their types.

2. (a) What are multi-threaded models? Explain types of multi-threaded model in detail.
   (b) Explain briefly the procedure to predict the next CPU burst in the shortest-job first algorithm.

3. (a) Discuss briefly the solution for dining-philosophers problem using monitors.
   (b) A barbershop consists of a waiting room with n chairs and the barber room containing the barber chair. If there are no customers to be served, the barber goes to sleep. If a customer enters the barbershop and all chairs are occupied, then the customer leaves the shop. If the barber is busy but chairs are available, then the customer sits in one of the free chairs. If the barber is asleep, the customer wakes up the barber. Write a program to coordinate the barber and the customers.

4. (a) Discuss in detail the swapping technique. What is its purpose?
   (b) What is paging? What is the need for page replacement? Discuss the basic method of paging in detail.

5. (a) Explain in detail copy-on-write technique.
   (b) Consider the following page reference string: 1,2,3,4,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. How many page faults would occur for the FIFO replacement algorithm for 3 frames?

6. (a) Explain the procedure for eliminating deadlocks using resource pre-emption.
   (b) How can we prevent the occurrence of deadlocks? Discuss in brief.

7. (a) Discuss in detail free space management .Also discuss about keeping track of free disk space in detail.
   (b) How protection can be provided for file system?

8. (a) Discuss briefly the general overview of the physical structure of secondary and tertiary storage devices.
   (b) Explain in detail the two ways of disk storage in which the computers access.
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Set No: 2

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Time: 3 Hours   **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) Define the essential properties of the following types of operating system:
    - (i)   Batch
    - (ii)   Real Time
    - (iii)   Time sharing
    - (iv)   Clustered

    (b) In a multiprogramming and time sharing environment several users share the system simultaneously. This situation can result in various security problems. Discuss these problems.

2. (a) The benefits of multithreaded programming can be broken down into four major categories. Explain briefly each of these categories.
    (b) What are the scheduling algorithms? Discuss briefly about the priority scheduling algorithm and the round-robin scheduling algorithm.

3. (a) Describe in detail about the critical-section problem? What are the requirements to be satisfied for its solution.
    (b) What are the classic problems of synchronization? Discuss briefly about the bounded-buffer problem?

4. (a) What is fragmentation? Explain in detail about the internal and external Fragmentation.
    (b) Why are segmentation and paging sometimes combined into one scheme?

5. (a) Discuss briefly about global versus local allocation of frames.
    (b) Consider LRU, FIFO, Optimal page replacement algorithms. Rank these algorithms from bad to perfect according to their page fault rate. Separate those algorithms which suffer from Belady's anomaly from those which do not.

6. (a) Explain in detail the banker's algorithm.
    (b) Explain about deadlock characterization in detail.

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7. (a) Explain in detail about the file attributes ,file operations and about the structure of a file system?

(b) What problems could occur if a system allowed a file system to be mounted simultaneously at more than one location?

8. (a) Discuss in detail about variety of techniques to improve the efficiency and performance of secondary storage.

(b) Explain in detail about swap space management.

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Set No: 3

III B.Tech. I Semester Regular Examinations, November/December - 2012
OPERATING SYSTEMS

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Time: 3 Hours   **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) What is an operating system? Explain briefly the operating systems role in the overall computer system.

    (b) Under what circumstances would a user be better off using a time sharing system rather than a PC or single-user workstation?

2. (a) Define process and explain with a neat diagram about process states and process control block. Discuss briefly system calls.
    (b) Discuss in detail schedulers. Describe the difference between different types of scheduling.

3. (a) Discuss briefly the procedure for implementing a monitor using semaphores.
    (b) Explain briefly about the following instructions:
    - i. TestAndSet()
    - ii. Swap()

4. (a) What is paging? Discuss in detail about basic method in paging. Discuss briefly about the common techniques for structuring the page table.
    (b) Consider the following segment table:

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?
    - i. 0, 430
    - ii. 1, 10
    - iii. 3, 400
    - iv. 4, 112

5. (a) What is demand paging ? Discuss in detail the steps in handling a page fault .Explain about performance of demand paging in detail.
    (b) 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.

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6. (a) Consider a system with five processes P_0 through P_4 and three resource types A,B,C. Resource type A has 10 instances ,resource type B has 5 instances and resource type C has 7 instances . Suppose that, at time T_0 the following snapshot of the system has been taken

	Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	7 5 3	3 3 2
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	

Find whether this system is safe or not .Also find sequence that satisfies safety requirement.
(b) What is the optimistic assumption made in deadlock-detection algorithm? How could this assumption be violated?

7. (a) Explain the directory implementation of a file system in detail.
(b) What are the allocation methods of a file system? Explain briefly the indexed and linked allocation.

8. (a) Elucidate disk structure in detail. Explain about disk scheduling in detail.
(b) What is disk scheduling? Explain in detail about FCFS and SSTF scheduling.

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Time: 3 Hours   **Max Marks: 75**

Answer any FIVE Questions
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1. (a) How are network computers different from traditional personal computers?
   Describe some usage scenarios in which it is advantageous to use network   computers.
   (b) Explain briefly about the services and functions provided by the operating system.

2. (a) Explain in detail round robin scheduling algorithm .With an example show how a smaller time quantum increases context switches.
   (b) Describe the differences between short-term, medium-term and long-term scheduling.

3. (a) Describe about semaphores and their usage and implementation.
   (b) Explain about Peterson's solution to the critical section problem.

4. (a) Discuss briefly memory mapping and protection.
   (b) What is segmentation? Describe in detail about general method with hardware implementation of segmentation.

5. (a) Discuss briefly about virtual memory management.
   (b) Explain in detail copy-on-write technique.

6. (a) Consider the following snapshot of the system

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P_0	0 0 1 2	0 0 1 2	1 5 2 0
P_1	1 0 0 0	1 7 5 0	
P_2	1 3 5 4	2 3 5 6	
P_3	0 6 3 2	0 6 5 2	
P_4	0 0 1 4	0 6 5 6	

   Find whether this system is safe or not .Also find sequence that satisfies safety requirement.
   (b) What are the four conditions that hold simultaneously in a system for the deadlock situation to arise?

7. (a) Describe briefly the procedure of protecting files in the system.
   (b) Explain in detail about the free space management in file system.

8. (a) None of the disk-scheduling disciplines, except FCFS, is truly fair(Starvation may occur).
   i)   Explain why this assertion is true.
   ii)   Describe a way to modify algorithm such as SCAN to ensure fairness.
   (b) Describe about disk attachment in detail.
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