Code No: RR311301 **Set No. 1**

III B.Tech I Semester Regular Examinations, November 2006
OPERATING SYSTEMS
(Electronics & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the basic instruction cycle with example.
   (b) What is an Interrupt? Describe the different types of interrupts. [8+8]
2. (a) Describe various operations on threads.
   (b) Discuss about threads synchronization.
   (c) Write about Kernel level threads. [6+5+5]
3. Explain the various mechanisms provided by UNIX for inter process communication and synchronization in detail [16]
4. (a) What are the conditions that must satisfy for deadlock occurrence and explain them.
   (b) Is the deadlocks problem preventable? Justify your answer with example and diagram. [8+8]
5. (a) Explain in detail about the fetch policy supported by the Operating System
   (b) A computer has a cache main memory and a disk used for virtual memory. If a referenced word is in the cache, 20 nanoseconds are required to access it. If it is in the main memory but not in the cache, 60 nanoseconds are needed to load it into the cache, and then the reference is started again. If the word is not in main memory, 12 milliseconds are required to fetch the work from disk, followed b 60 nanoseconds to copy it to the cache, and then reference is started again. The cache hit ratio is 0.9 and the main memory hit ratio is 0.6. What is the average time in nanoseconds required to access a referenced word on this system?
   (c) Differentiate using a neat sketch between direct and associate lookup for page table entries. [5+5+6]
6. (a) What are preemptive and non-preemptive scheduling policies?
   (b) Describe non-preemptive scheduling policies [8+8]
7. (a) What do you understand by a file directory?
   (b) Explain briefly the information elements of a file directory
   (c) Explain what is tree-structured directory? [5+5+6]
8. What do you understand by Trusted systems? Draw a figure of reference monitor concept and explain. [5+5+6]

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Code No: RR311301 **Set No. 2**

III B.Tech I Semester Regular Examinations, November 2006
OPERATING SYSTEMS
(Electronics & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What is OS? Describe the different types of Operating systems with the examples. [16]

2. Discuss about the following:
   (a) user-level threads
   (b) Kernel-level threads
   (c) Multi-threadings. [5+5+6]

3. What is queuing discipline? Explain with an example the way in which the message passing can be used to enforce mutual exclusion. [4+6+6]

4. Explain all the strategies involved in deadlock detection and how it is recovered. [8+8]

5. (a) Explain in detail about the fetch policy supported by the Operating System
   (b) A computer has a cache main memory and a disk used for virtual memory. If a referenced word is in the cache, 20 nanoseconds are required to access it. If it is in the main memory but not in the cache, 60 nanoseconds are needed to load it into the cache, and then the reference is started again. If the word is not in main memory, 12 milliseconds are required to fetch the work from disk, followed b 60 nanoseconds to copy it to the cache, and then reference is started again. The cache hit ratio is 0.9 and the main memory hit ratio is 0.6. What is the average time in nanoseconds required to access a referenced word on this system?
   (c) Differentiate using a neat sketch between direct and associate lookup for page table entries. [5+5+6]

6. Write short notes of the following
   (a) Random disk scheduling
   (b) Priority disk scheduling
   (c) Disk Cache [5+5+6]

7. (a) What do you understand by a file directory?

(b) Explain briefly the information elements of a file directory

(c) Explain what is tree-structured directory? [5+5+6]

8. (a) What are the various classes of intruders?

(b) Discuss about intrusion techniques. [8+8]

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Code No: RR311301 **Set No. 3**

III B.Tech I Semester Regular Examinations, November 2006
OPERATING SYSTEMS
(Electronics & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the basic instruction cycle with example.
   (b) What is an Interrupt? Describe the different types of interrupts. [8+8]
2. (a) Explain the role of process control block in OS.
   (b) Differentiate the following
      i. Process Switching vs Context Switching
      ii. Clock interrupt Vs I/O interrupt. [8+8]
3. What is Readers/Writers problem? Explain the method of solving the problem by using Semaphores with Writers having priority. [8+8]
4. What is deadlock avoidance? Explain process initiation denial and resource allocation denial in detail with example. [4+4+4+4]
5. (a) Discuss the differences between a pure paging and pure segmentation virtual memory systems. What are the pros and cons of each scheme?
   (b) What are the three main issues of implementing a virtual memory system?
   (c) Comment on the relative merits of using a local versus a global page replacement policy. [6+5+5]
6. Compare and contrast of various disk scheduling algorithm [16]
7. (a) What do you understand by a file directory?
   (b) Explain briefly the information elements of a file directory
   (c) Explain what is tree-structured directory? [5+5+6]
8. What do you understand by Trusted systems? Draw a figure of reference monitor concept and explain. [5+5+6]

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Code No: RR311301 **Set No. 4**

III B.Tech I Semester Regular Examinations, November 2006
OPERATING SYSTEMS
(Electronics & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the important properties of I/O organization? Explain the I/O communication techniques with an example. [5+6+5]

2. (a) Explain the reasons for process terminations.
   (b) Describe the single blocked queue and multiple blocked queues with an example. [4+12]

3. (a) Write the program for mutual exclusion using semaphores.
   (b) Explain about infinite buffer producer/consumer problem for concurrent processing which uses binary semaphores [8+8]

4. (a) Consider the following snapshot of a system of 5 processes and 4 resources.

Process	Allocation	Max.	Available
P_0	0012	0012	1520
P_1	1000	1750	
P_2	1354	2356	
P_3	0632	0652	
P_4	0014	0656	

   i. What is the content of the vector need
   ii. Is the system in a safe state? Verify with algorithm.
   iii. If a request from process P_1 arrives for (0 4 2 0) resources, can the request is immediately granted? Why? With the help of necessary algorithms explain all the steps.

   (b) Whar are the diffculties that amy arise when a proces is rolled back as the result of a dead lock. [8+8]

5. Consider a memory management system with demand paging. There are there processes P1, P2, P3 which have one page of private memory each. Moreover P1 and P2 are sharing an array A which fits entirely into one memory page. Similarly, P2 and P3 are sharing an array B, which fits into a memory page.

   (a) Let all the data for the processes be located into physical memory. Draw a possible memory allocation diagram, give the page tables for the three processes.
   (b) Assume that process P1 gets swapped out of memory entirely. How are the page tables changing.

(c) Assume that process P1 gets swapped back into memory. Give the page tables in this situation. [5+5+6]

6. (a) What is the transfer rate of a 9 track magnetic tape unit whose tape speed is 120 inches per second and whose tape density is 1600 linear bits per inch?

   (b) Assume a 2400-feet tape reel; an inter record gap of 0.6 inch; where the tape stops midway between reads; that the rate of tape speed increase or decrease during gaps is linear and other characteristics of the tape as same as above . How long will it take to read a full tape of 120-byte logical records blocked 10/physical record? [8+8]

7. (a) What do you understand by a file directory?

   (b) Explain briefly the information elements of a file directory

   (c) Explain what is tree-structured directory? [5+5+6]

8. What do you understand by Trusted systems? Draw a figure of reference monitor concept and explain. [5+5+6]

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