

II B.Tech II Semester Supplementary Examinations,

November/December 2005

OPERATING SYSTEMS

(Common to Information Technology and Computer Science & Systems Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

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

[16]

2. (a) Define the following

- i. Process
- ii. Program
- iii. Process control block
- iv. Process Scheduling

(b) Explain the process State Transition diagram with examples. [8+8]

3. What are the requirements for mutual exclusion? Explain them in detail. [8+8]

4. What are the principles of deadlock? And explain in detail the two categories of resources. [8+8]

5. (a) Another placement algorithm for dynamic partitioning is referred to as worst fit. In this case, the largest free block of memory is used for bringing in a process. Discuss the pros and cons of this method compared to first-fit and best fit.

(b) What is the average length of the search for worst-fit. [12+4]

6. (a) Which type of process is generally favoured by a multi-level feed back queuing scheduler, a processor bound process or an I/O bound process ?. Briefly explain why?

(b) Consider a variation of roundrobin that we will call priority round-robin. In priority round-robin each process has a priority in the range of 1 to 10. When a process is given a time slice the length of quantum is basic constant (say 50 ms) times the priority of the job. Compare this system with an ordinary priority system [8+8]

7. (a) What are preallocation, dynamic allocation, portion size w.r.t secondary storage management?

(b) Describe various file allocation methods. [8+8]

8. Write short notes on:

- (a) Trojan Horse defense
- (b) Trojan horses

[8+8]

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1. What is locality of reference? Explain the principles for the same. Also describe the method of Stack implementation. [16]
2. Discuss the attributes of the process. Describe the typical elements of process control Block. [6+10]
3. What are the requirements for mutual exclusion? Explain them in detail. [8+8]
4. (a) Three processes share 4 resource units that can be reserved and reused only one at a time. Each process needs a maximum of 2 units. Show that a deadlock cannot occur.
(b) N processes share M resource units that can be reserved and released only one at a time. The maximum need of each process does not exceed M and the sum of all maximum needs is less than $M + N$. show that a dead lock cannot occur. [8+8]
5. (a) Explain the operation of paging and translation look-aside buffer using a neat sketch
(b) Explain the address translation in a paging system using a neat sketch.
(c) Explain using illustrations typical memory management formats [6+5+5]
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 are preallocation, dynamic allocation, portion size w.r.t secondary storage management?
(b) Describe various file allocation methods. [8+8]
8. Write short notes on:
(a) Trojan Horse defense

(b) Trojan horses

[8+8]

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1. What is OS? Describe the different types of Operating systems with the examples.
[16]
2. Discuss the attributes of the process. Describe the typical elements of process control Block.
[6+10]
3. What is message passing? Explain the design characteristics of message systems for inter process communication and synchronization.
[2+4+5+5]
4. Explain the banker's algorithm in detail.
[16]
5. Write short notes on the following:
 - (a) Page Table structure
 - (b) Translation look-aside buffer.
 - (c) Segmentation
 - (d) Paging
[16]
6.
 - (a) Describe about various disk performance parameters?
 - (b) We noted that successive requests are likely to be from the same cylinder. what does this imply about the expected performance of the FCFS and SSTF disk scheduling algorithms.
[8+8]
7. Write short notes on:
 - (a) Sequential file
 - (b) Indexed file
 - (c) Indexed sequential file
 - (d) Direct file.
[4+4+4+4]
8. Write short notes on
 - (a) Viruses
 - (b) Worms
 - (c) Logic bomb

(d) Trap door

[4+4+4+4]

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1. Differentiate the following
 - (a) DMA Vs Interrupt driven I/O
 - (b) Programmed I/O Vs Memory Mapped I/O [8+8]
2. Discuss the attributes of the process. Describe the typical elements of process control Block. [6+10]
3. What is message passing? Explain the design characteristics of message systems for inter process communication and synchronization. [2+4+5+5]
4. What are the principles of deadlock? And explain in detail the two categories of resources. [8+8]
5. (a) Another placement algorithm for dynamic partitioning is referred to as worst fit. In this case, the largest free block of memory is used for bringing in a process. Discuss the pros and cons of this method compared to first-fit and best fit.
(b) What is the average length of the search for worst-fit. [12+4]
6. (a) What are the criteria based on which scheduling policies are evaluated.
(b) Describe round robin and feedback scheduling policies. [8+8]
7. Write about
 - (a) Free space management
 - (b) Reliability of a file allocation [8+8]
8. Discuss about security implementation by pass-word protection [16]
