[Total No. of Questions - 5] [Total No. of Printed Pages - 4]
(2066)

16112(J)

B. Tech 6th Semester Examination

Operating Systems (NS) June-16

CS-300(e)

Time : 3 Hours Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, select one question from each sections A, B, C and D. Section E is compulsory.

SECTION - A

1. (a) What is an expression tree? How an expression is evaluated using an expression tree? Discuss its advantages over the other evaluation techniques. (10)

   (b) Why we need operating system? Explain it with reference to the responsibilities of operating system. (10)

OR

   (a) Give overview of Distributed operating system by considering modern computer for managing primary resources. (10)

   (b) Discuss in detail Table management Techniques. (10)

SECTION - B

2. (a) What is a semaphore? Explain with role of semaphore. Also explain busy waiting semaphores. (10)

   (b) What are the four necessary conditions of deadlock prevention? Discuss in detail. (10)

OR

   (a) Consider the RPC mechanism. Describe the undesirable circumstances that could arise from not enforcing either the "at most once" or "exactly once" semantics. Describe possible uses for a mechanism that had neither of these guarantees. (10)

   (b) Can a multithreaded solution using multiple user-level threads achieve better performance on a multiprocessor system than on a single-processor system? Justify your answer. (10)

SECTION - C

3. (a) List the properties which a hashing function should possess to ensure a good search performance. What approaches are adopted to handle collision? (10)

   (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?

a. 0.430 b. 1.10 c. 2,500 d. 3,400 e. 4,112

(10)

OR

(a) Consider a demand-paging system with a paging disk that has an average access and transfer time of 20milli seconds. Addresses are translated through a page table in main memory, with an access time of 1 microsecond per memory access. Thus, each memory reference through the page table takes two accesses. To improve this time, we have added an associative memory that reduces access time to one memory reference, if the page-table entry is in the associative memory. Assume that 80 percent of the accesses are in the associative memory and that, of the remaining, 10 percent (or 2 percent of the total) cause page faults. What is the effective memory access time? (12)

(b) Why is segmented paging important (as compared to a paging system)? What are the different pieces of the virtual address in a segmented paging? (8)

SECTION - D

4. (a) Discuss whether AFS and NFS provide the following: (a) location transparency and (b) location independence. (10)

(b) How are the access-matrix facility and the role-based access-control facility similar? How do they differ? (10)

OR

(a) The UNIX program COPS scans a given system for possible security holes and alerts the user to possible problems. What are two potential hazards of using such a system for security? How can these problems be limited or eliminated? (10)

(b) Write a short note on Android OS and Linux OS. (10)

SECTION - E

5. Note: Each part is of two marks:

(a) What is Real time operating system?

(b) What are time .sharing systems?

(c) Give some benefits of multithreaded programming.

(d) What is RR scheduling algorithm?

(e) What is CPU Scheduler?

(f) What is DRAM? In which form does it store data?

(g) What is INODE in unix file system?

(h) How does swapping result in better memory management?

(i) What is Direct Access Method?

(j) What is spooling? (2×10=20)