B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Sixth Semester

Electronics and Communication Engineering

EC 034 — OPERATING SYSTEMS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Suppose it takes 100 ns to access a page table and 20 ns to access the associative memory. For a 90 percent hit ratio, determine the average access time.

2. Draw a neat sketch showing CPU utilisation as a function of the number of processes in memory.

3. What is mutual exclusion?

4. Distinguish between preemptive scheduling and non-preemptive scheduling.

5. Why is information stored in files said to be persistent?

6. What is Trojan horse attack?

7. State the advantages of distributed systems over independent PCs.

8. Why is deadlock avoidance never used in distributed systems?

9. Name the two key data structures used by process management in UNIX.

10. Why is process management straight forward in MS-DOS?

11. (i) State and describe Belady's anamoly. (8)

    (ii) Show that the optimum page size p is given by $p = \sqrt{2se}$ where the symbols used have the usual meaning. (8)

12. (a) State Dijkstra's dining philosopher's problem and explain how can it be solved using semaphores.

Or

    (b) (i) Show that the shortest job first scheduling algorithm always produces the minimum turn around time. (8)

    (ii) The aging algorithm with $a = 0.5$ is being used to predict run times. The previous four runs from oldest to most recent are 40, 20, 40 and 15 m sec. What is the prediction of the next time? (8)

13. (a) (i) Describe the three kinds of files. (10)

    (ii) Describe two solutions to the bad block problem. (6)

Or

    (b) (i) Explain password authentication. (6)

    (ii) What is the difference between a virus and a worm? How do these reproduce? (10)

14. (a) (i) Discuss the disadvantages of distributed systems. (8)

    (ii) Describe the primary tasks of a micro kernel. (8)

Or

    (b) (i) With the help of a suitable example, explain the 'bully algorithm'. (6)

    (ii) Explain how deadlock can be detected using Chandy-Misra-Haas algorithm. (10)

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15. (a) (i) Using a neat sketch, describe the Amoeba system architecture. (12)

(ii) Why is process creation in Amoeba different from UNIX? (4)

Or

(b) (i) Mach supports the concept of a processor set. On what class of machines does this concept make the most sense? (4)

(ii) Describe the differences between Amoeba and Mach. (12)