ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : DECEMBER 2009

REGULATIONS – 2007

FOURTH SEMESTER

070230013 - OPERATING SYSTEMS

(COMMON TO CSE / IT)

TIME : 3 Hours Max.Marks : 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. What are the purpose of an Operating System?
2. What are the advantages of Distributed System?
3. What is system call? List the types of System calls?
4. What is mean by long term scheduler and short term scheduler?
5. List the various Multithreading models.
6. What is deadlock and starvation?
7. Write short notes on critical section problem.
8. What are the types of real-time scheduling?
9. What is the need for synchronization?.
10. Draw Resource Allocation Graph with a deadlock.
11. What is mean by safe state?
12. Compare and contrast logical address space and Physical address space
13. What is External Fragmentation? How will you reduce it?
14. What is role of valid and invalid bit of a page table?
15. Define lazy swapper.
16. What are overlays?
17. List the various attributes of a file.
18. What are the different types of file access modes?

19. How free-space is managed using bit vector implementation?
20. What are the various disk-scheduling algorithms?

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21. a) Explain the Operating System Services 8

    b) Write notes on Batch Processing System and Time Sharing System 4

22. Explain the following

    (i) Process States (ii) Process Control Block (PCB)

23. What is semaphore? Explain how semaphores are implemented?

24. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order *P*1, *P*2, *P*3, *P*4, *P*5, all at time 0.

Cont...Q.No.24

a. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.

b. What is the turnaround time of each process for each of the scheduling algorithms in part a?

c. What is the waiting time of each process for each of the scheduling algorithms in part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

25. a) Explain the concept of Swapping with a suitable diagram 4

b) Explain the address translation scheme of Paging 8

26. a) Explain Indexed File Allocation with a suitable diagram 6

b) Consider the following page reference string: 6

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the LRU replacement algorithm, assuming one, two, three, four, five, six, or seven frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.

27. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is

86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130.

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling algorithms?

a. FCFS b. SSTF c. SCAN d. LOOK e. C-SCAN

28. Explain the Components of Linux Operating System and Explain How processes are handled in Linux Operating System

*****THE END*****