Reg. No. : | | | | | | | | | | | |

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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Fourth Semester

(Regulation 2004)

Computer Science and Engineering

CS 1252 — OPERATING SYSTEMS

(Common to B.E. (Part-Time) Third Semester Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What is context switching?

2. What is the difference between batch system and multiprogramming systems?

3. What is the purpose of system programs?

4. Explain Associative Mapping.

5. Differentiate RAID level 0 and RAID level 1.

6. What are the functions of file organization module in file system?

7. List the features of Linux system.

8. Explain why spin locks are not appropriate for uniprocessor system yet may be suitable for multiprocessor system.

9. Explain the advantages of inverted page tables.

10. Mention the advantages in the design of Distributed Operating Systems.

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Define the essential properties of Real Time Operating Systems. (6)

(ii) Discuss briefly the various issues involved in implementing Inter process communication (IPC) in message passing system. (10)

Or

(b) (i) Explain the different operations of processes. (6)

(ii) Differentiate symmetric and asymmetric multiprocessing system. (5)

(iii) Explain Process State Transition with diagram. (5)

12. (a) (i) Discuss the critical section problem. State the basic requirements of critical section problem solution. (6)

(ii) Explain the implementation of Producers/Consumers problem using monitor. (10)

Or

(b) Assume the following processes arrive for execution at the time indicated and also mention with the length of the CPU-burst time given in milli seconds.

Job	Burst Time (ms)	Priority	Arrival time (ms)
P1	6	2	0
P2	2	2	1
P3	3	4	1
P4	1	1	2
P5	2	3	2

(i) Give a Gantt chart illustrating the execution of these processes using FCFS, Round Robin (quantum = 1), and Priority (Preemptive and Non Preemptive). (4)

(ii) Calculate the average waiting time and average turn around time for each of the above scheduling algorithm. (12)

13. (a) Consider the following snapshot of a system. Execute Banker's algorithm answer the following.

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	1	0	0	1	1	1	5	2	2
P_1	1	0	0	1	1	7	5	1				
P_2	1	3	5	1	2	3	5	2				
P_3	0	5	3	1	1	6	5	2				
P_4	0	0	1	1	5	6	5	1				

(i) What is the content of a need matrix? (2)

(ii) Is the system in a safe state? If the system is safe, show how all the process could complete them execution successfully. If the system is unsafe, show how deadlock might occur. Explain. (6)

(iii) If a request from Process P_1 arrives (0, 3, 2, 0) can the request be granted? If yes, write the sequence of allocation. (8)

Or

(b) (i) Explain the contiguous and non-contiguous memory storage allocation scheme. (8)

(ii) Explain the Segmentation memory management scheme. (8)

14. (a) Consider the following page reference string :

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

Calculate the number of page faults would occur for the following page replacement algorithm with frame size of 4 and 5.

(i) LRU

(ii) FIFO

(iii) Optimal. (16)

Or

(b) (i) Explain the page fault handling routine with diagram. (6)

(ii) Explain and compare different file access methods. (10)

15. (a) A hard disk having 500 cylinders, numbered from 0 to 499. The drive is currently serving the request at cylinder 143, and the previous request was at cylinder 125. The status of the queue is as follows :

86, 470, 13, 177, 448, 150, 102, 175, 130.

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?

(i) SSTF (ii) FCFS (iii) SCAN (iv) LOOK. (16)

Or

(b) (i) Explain the indexed and linked file allocation methods. Discuss the advantages and disadvantages in those methods. (10)

(ii) How are the processes and threads executed in Linux? (6)
