MCS-041

MCA (Revised)

Term-End Examination

December, 2008

01269

MCS-041 : OPERATING SYSTEMS

Time : 3 hours *Maximum Marks : 100*

(Weightage-75%)

Note : *Question number 1 is* ***compulsory.*** *Attempt* ***any three*** *questions from the rest.*

1. (a) A system contains 10 units of a resource R1. The resource requirement of 3 user processes P1, P2, P3 can be summarised as : **10**

	P1	P2	P3
Max. Requirement	8	7	5
Current Allocation	3	1	3
Balance Requirement	5	6	2
New Requirement Made	1	0	0

Is the current allocation state feasible and safe ? Explain.

(Note : - Use Banker's algorithm).

(b) Give solution to the Dining Philosopher's problem using semaphores. Give a suitable example to explain it. **10**

(c) Compare and contrast sharing of segments with sharing of pages. Explain the concept of page faults with an example. **10**

(d) Explain any 2 disk scheduling algorithms. Calculate the total head movement with the 2 algorithms taken up. The block sequence is as follows : **10**

51, 90, 81, 152, 190, 140, 72, 100

Assume that the head is initially on block number 20. Draw the diagrams for both the algorithms. Also explain the diagrams.

2. (a) Explain "*working set*" model. Explain it's concept as well as implementation. **5**

(b) Compare Direct file with indexed sequential file organisation. **5**

(c) Discuss switching strategies in Distributed Operating System environment. Also give short notes on Reliability and overheads in protocol design. **10**

3. (a) Give a short note on conditional critical region. **5**

(b) Explain file processing in UNIX. Compare it with WINDOWS file processing. **5**

(c) Compare and Contrast Access List and Capability List. Discuss the implementation of a security and protection algorithm in a distributed operating system environment. **10**

4. (a) Explain Resource allocation graph for multiple instances (with an example). Also explain the procedures in Deadlock recovery. **10**

(b) For the given 4 processes arriving at time 0 (zero) in the order with length of CPU time in milliseconds : **10**

Process	Processing time
P1	10
P2	12
P3	30
P4	29

Obtain average waiting time and turnaround time for SJF and Round Robin (RR) – (Quantum = 3) scheduling algorithms for above said processes.

Which algorithm takes lesser average waiting time ?

5. (a) Explain take-grant model for operating system security with an example. **10**

Also explain the mechanisms of security in WIN 2000 operating system.

(b) Explain Lamport's algorithm for ordering of events in a distributed environment with an example. **10**

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