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MCS-041

01395

MCA (Revised)

Term-End Examination

December, 2013

MCS-041 : OPERATING SYSTEMS

Time : 3 hours *Maximum Marks : **100***

Weightage : 75%

Note : *Question No. **1** is **compulsory**. Answer **any three** questions from the rest.*

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

	P1	P2	P3
Max. Requirement	7	3	5
Current Allocation	3	2	3

Is the current allocation state feasible and safe ? Apply Banker's algorithm to check it.

If a new request of (2, 1, 0) arises, check whether it will be granted or not using Banker's algorithm ?

(b) Discuss the common failures in distributed systems. **10**

(c) Write and explain the Bakery's algorithm to handle the critical section problem for 'n' processes. **10**

(d) Explain the structure of UNIX operating system and its components in brief. **10**

2. (a) Explain FCFS and SSTF disk scheduling algorithms. Calculate the total head movement with the FCFS and SSTF for the following blocks. **10**

50, 91, 150, 92, 130, 18, 140, 70, 60

Initially the head is on block No. 53. Draw the movement diagram also.

(b) Discuss the implementation issues and considerations involved in processing and memory management in multiprocessor operating system. **10**

3. (a) Compare and contrast the architecture of WINDOWS OS with UNIX OS. **10**

(b) Explain what causes the thrashing ? Suggest the mechanism to avoid the thrashing. **6**

(c) With the help of diagrams, explain the concept of demand paging and demand segmentation. **4**

4. (a) Briefly describe the following CPU scheduling algorithms : 3+3+4

(i) FCFS

(ii) RR

(iii) Priority Based Scheduling

Explain the difference in the degree to which the above scheduling algorithms discriminate in favour of short processes.

(b) Define mutual exclusion in distributed systems and give an example. Also write and explain the Ricart and Agrawala's mutual exclusion algorithm in distributed systems. 10

5. (a) Explain the two non-contiguous disk storage allocation schemes with the help of an illustration for each. 10

(b) Explain the Bell and La Padula Model. Also explain the few components of Information Flow Model. 10