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MCS-041

MASTER OF COMPUTER APPLICATIONS (MCA) (REVISED)

Term-End Examination

December, 2020

MCS-041 : OPERATING SYSTEMS

Time : 3 Hours *Maximum Marks : 100*

Weightage : 75%

Note : *(i) Question* ***No. 1*** *is compulsory.*

(ii) Attempt any ***three*** *questions from the rest.*

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1. (a) For the following processes and processing time :

Processes	Processing Time
P1	1
P2	5
P3	4
P4	4
P5	6

Draw Gantt charts showing the execution of these processes for : 10

(i) FCFS

(ii) SJF

(iii) Round Robin Scheduling (Quantum = 1)

Also calculate the waiting time, average waiting time, turnaround time and average turnaround time for the processes for the above scheduling algorithms.

(**Note :** All the processes arrived at the same time).

(b) A system contains 10 units of resource R1. The resource requirement of 3 user processes P1, P2, P3 can be summarized 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.

(c) Explain the Bell and La Padula model. Also explain the few components of information flow model. 10

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

2. (a) Explain demand paging with the help of suitable diagrams. 5

(b) What is Belady's anomaly ? In which page replacement algorithm this anomaly occurs ? Explain with an example. 5

(c) Give a problem statement and a solution for dining philosopher's problem. 10

3. (a) What is Thrashing ? Explain the working set model to avoid the thrashing. 10

(b) Explain the following security models : 10

(i) Access Matrix Model

(ii) Rule Based Access Control

4. (a) Explain the memory management of Windows 2000 O/S. 10

(b) Explain Lamport-Bakery's algorithm in a distributed O/S environment. 10

5. Write short notes on any ***four*** of the following : 5 each

(a) Resource Allocation Graph

(b) Spooling

(c) Real time O/S

(d) Translation Look-Aside Buffer (TLB)

(e) Design issues in Distributed Systems