BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – MCA-2022/MCA-2023
Course Name – Advanced Operating Systems
Course Code - MCA202
(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Which of the following provides the interface for accessing the services of the operating system?

a) library b) system calls
c) assembly instructions d) none of these

(ii) Infer which one of the following is not a real time operating system?

a) RTLinux b) Palm OS
c) QNX d) VxWorks

(iii) In a timeshare operating system, determine the state in which the process switches from the current state when the time slot assigned to a process is completed.

a) suspended state b) terminated state
c) ready state d) blocked state

(iv) Analyze: The size of virtual memory is based on

a) CPU b) RAM
c) Address bus d) Data bus

(v) Identify the state where the process comes from its current state when the time slot assigned to a process is completed in the timeshare operating system.

a) ready state b) suspended state
c) terminated state d) blocked state

(vi) When a process is in a Blocked state waiting for some I/O service and when the service is completed, it goes to the _____. Determine the right answer from the following:

a) terminated state b) suspended state
c) running state d) ready state

(vii) Determine where are placed the list of processes that are prepared to be executed and waiting?

a) Job queue
b) Ready queue
c) Execution queue
d) Process queue

(viii) Estimate from the following that can block the running process?

a) fork
b) read
c) down
d) all of these

(ix) Decide which conditions must be satisfied to solve a critical section problem?

a) Bounded Waiting
b) Progress
c) Mutual exclusion
d) All of these

(x) Among the following CPU scheduling algorithms, which of these allocated the CPU first to the process that requests the CPU first?

a) FCFS
b) SJF
c) Priority scheduling
d) None of these

(xi) Predict the two steps of a process execution.

a) CPU & I/O Burst
b) I/O & OS Burst
c) Memory & I/O Burst
d) CPU & Memory Burst

(xii) In mutiprogramming with fixed partitions, if a process requires more memory than is available in a partition, it may lead to: select the right one.

a) Fragmentation
b) Deadlock
c) Priority inversion
d) Starvation

(xiii) Evaluate the maximum number of processes that can be in Ready state for a computer system with n CPUs is

a) n
b) n^2
c) 2^n
d) Independent of n

(xiv) Select the right option: Virtual memory implements the translation of a program address space to _____.

a) virtual addresses
b) physical addresses
c) mapping addresses
d) page addresses

(xv) Which of the following is true?

a) Overlays are used to increase the size of physical memory
b) Overlays are used to increase the logical address space
c) When overlays are used, the size of a process is not limited to the size of the physical memory
d) Overlays are used whenever the physical address space is smaller than the logical address space

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define an Operating System with examples. (3)
3. Discover the benefits of a multiprocessor system. (3)
4. Analyze the role of a Kernel in an Operating System. (3)
5. Discuss the non-preemptive and preemptive process scheduling. (3)
6. Compare between User-level thread and Kernel-level Thread. (3)

OR

Predict the major problems to implement Demand Paging. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. If the CPU scheduling policy is Round Robin, then evaluate the average turn around time, waiting time and response time of the following processes as shown in the figure below. Assume the time quantum is 2. (5)

Process No.	Arrival Time	Burst Time
P1	0	5
P2	1	4
P3	2	2
P4	4	1

8. Compare between the Kernel mode and User mode. (5)
9. Describe the five state Process model with diagram. (5)
10. Express the concept of deadlock in process synchronization and its causes in concurrent programs. (5)
11. Justify that mutual exclusion is essential condition for Deadlock. (5)
12. Explain Authentication. (5)

OR

Explain Security of OS. (5)

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