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Subject Code:- AMCA0102

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: I - CARRY OVER THEORY EXAMINATION - AUGUST 2022

Subject: Operating System

Time: 3 Hours

Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 marks each.
3. Section B - Question No-3 is based on external choice carrying 6 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A 20

1. Attempt all parts:-

1-a. Which of the following is not an operating system? (CO1) 1

(a) Windows

(b) Linux

(c) Oracle

(d) DOS

1-b. What is an operating system? (CO1) 1

(a) collection of programs that manages hardware resources

(b) system service provider to the application programs

(c) interface between the hardware and application programs

(d) all of the mentioned

1-c. . The operating system must allocate and deal various resources for each active (CO2) 1

(a) Process

(b) Resource

(c) Processor

(d) I/O Device

1-d. A Requirement for mutual exclusions a process remains inside its critical section for a (CO2) 1

(a) Infinite Time

(b) Finite Time

(c) Time

(d) None

1-e. What is a reusable resource? (CO3) 1

(a) that can be used by one process at a time and is not depleted by that use

(b) that can be used by more than one process at a time

(c) that can be shared between various threads

(d) none of the mentioned

1-f. Which one of the following is the deadlock avoidance algorithm?(CO3) 1

(a) banker's algorithm

(b) round-robin algorithm

(c) elevator algorithm

(d) karn's algorithm

1-g. Run time mapping from virtual to physical address is done by a hardware device the_____(CO4) 1

(a) Memory management unit

(b) CPU

(c) PCI

(d) None of the mentioned

1-h. The address generated by the CPU is referred to as _____(C04) 1

(a) Physical address

(b) Logical address

(c) Neither physical nor logical

(d) None of the mentioned

1-i. The time disk controller takes for the beginning of the sector to reach the head is known as ……..(CO5) 1

(a) seek time

(b) rotational delay

(c) access time

(d) transfer time

1-j. ……. layer deals with the logical structure of files and with the operations that can be specified by users such as open, close, read and write. (CO5) 1

(a) Physical organization

(b) File system

(c) Directory management

(d) Scheduling and control

2. Attempt all parts:-

2.a. Write any 3 differences between thread and process? (CO1) 2

2.b. What is a process? Draw and explain process state diagram(CO2) 2

2.c. What are the 3 different types of scheduling queues?(CO3) 2

2.d. Define thrashing. (CO4) 2

2.e. What is meant by Locality of Reference?(CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. Define essential properties of the Real time operating system. (CO1) 6

3-b. What is multiprogramming systems? Explain in detail.(CO1) 6

3 What are semaphores? Explain two primitive semaphore operations.(CO2) 6

3 Explain three requirements that a solution to critical–section problem must satisfy.(CO2) 6

3.e. Define Starvation in deadlock? (CO3) 6

3.f. Describe the action taken by the operating system when a page fault occurs.(CO4) 6

3.g. What is virtual memory? Explain (CO5) 6

SECTION C 50

4. Answer any one of the following:-

4-a. What is a layered architecture of Operating system? Explain with figure. (CO1) 10

4-b. What are the five differences between RAM and ROM? (CO1) 10

5. Answer any one of the following:-

5 What are the various scheduling criteria for CPU scheduling?(CO2) 10

5 What are client server systems & Peer-to-Peer systems? (CO2) 10

6. Answer any one of the following:-

6-a. Consider the following set of four processes, with the length of CPU burst time given in milliseconds. (CO3) 10

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Draw Gannt chart and find average waiting time and response time using

•FCFS

•Round Robin (quantum=2)

•SJF and SRTF

6-b. Differentiate Pre-emptive and Non-preemptive scheduling giving the application of each of them.(CO3) 10

7. Answer any one of the following:-

7 Consider the following page reference string 10

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

Find out the number of page faults if there are 4 page frames, using the following page replacement algorithm

i) LRU ii) FIFO iii) Optimal (CO4)

7 What is fragmentation? Explain its types and disadvantages.(CO4) 10

8. Answer any one of the following:-

8-a. What is protection? Explain principles and goals of protection. (CO5) 10

8-b. Write the comparative study of Windows, Linux and Android Operating System.(CO5) 10