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Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

MCA

SEM: I - THEORY EXAMINATION (2021 - 2022)

Subject: Operating System

Time: 03:00 Hours Max. Marks: 100

General Instructions:

1. All questions are compulsory. It comprises of three Sections A, B and C.

- Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is very short type questions carrying 2 marks each.
- Section B - Question No- 3 is Long answer type - I questions carrying 6 marks each.
- Section C - Question No- 4 to 8 are Long answer type - II questions carrying 10 marks each.
- 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. To access the services of operating system, the interface is provided by the _____ (CO1) 1

1. System calls
2. API
3. Library
4. Assembly instructions

1-b. Which one of the following is not a real time operating system? (CO1) 1

1. VxWorks
2. QNX
3. RTLinux
4. Palm OS

1-c. The address of the next instruction to be executed by the current process is provided by the: (CO2) 1

1. CPU registers
2. program counter
3. process stack
4. pipe

1-d. In addressing, a many to one relationship is useful for (CO2) 1

1. Client Interaction
2. Client/Server Interaction
3. Server Interaction
4. None

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

1. that can be used by one process at a time and is not depleted by that use
2. that can be used by more than one process at a time
3. that can be shared between various threads
4. none of the mentioned

1-f. The circular wait condition can be prevented by _____. (CO3) 1

1. defining a linear ordering of resource types
2. using thread
3. using pipes
4. all of the mentioned

1-g. A memory buffer used to accommodate a speed differential is called _____. (CO4) 1

1. stack pointer
2. cache
3. accumulator
4. disk buffer

1-h. Swapping requires a _____. (CO4) 1

1. motherboard
2. keyboard
3. monitor
4. backing store

1-i. A ……. module controls the exchange of data between main memory and an I/O module. (CO5) 1

1. Programmed I/O
2. Interrupt driven I/O
3. Direct Memory Access
4. Virtual Memory Access

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

1. Physical organization
2. File system
3. Directory management
4. Scheduling and control

2. Attempt all parts:-

2.a. What is monolithic kernel? Write 2 characteristics. (CO1) 2

2.b. What is sleeping barber problem? Explain. (CO2) 2

2.c. What is the difference between a preemptive and non-preemptive scheduling algorithms? (CO3) 2

2.d. Explain drawbacks of demand paging. (CO4) 2

2.e. Define Seek Time and Latency Time. (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. What is an operating system? Explain with its characteristics. (CO1) 6

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

3-c. Explain solution to producer-consumer problem. (CO2) 6

3-d. What do you mean by binary semaphore and counting semaphore? (CO2) 6

3.e. Explain the concept of ‘process’. also describe the contents of a process control block(PCB). (CO3) 6

3.f. Explain the best fit, first fit and worst fit and its advantages and disadvantages. (CO4) 6

3.g. Explain drawbacks of Linux operating system. (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. Write any 5 differences between multithreaded and multitasking operating system? (CO1) 10

5. Answer any one of the following:-

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

5-b. Explain the layered approach of the operating system? (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. Explain the concept of ‘process’. also describe the contents of a process control block(PCB) . (CO3) 10

7. Answer any one of the following:-

7-a. What is paging and swapping? (CO4) 10

7-b. Define external fragmentation. What are the causes for external fragmentation? (CO4) 10

8. Answer any one of the following:-

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

8-b. What are the File system implementation issues? (CO5) 10