GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2020-2021
OPERATING SYSTEMS
IT503

TIME ALLOTTED: 3 HRS   **FULL MARKS: 70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any *ten* from the following, choosing the correct alternative of each question: **10×1=10**

		Marks	CO No
1(i)	A CPU contains	1	CO3

    a. card reader and a printing device
    b. an analytical engine and a control unit
    c. a control unit and an arithmetic unit
    d. an arithmetic logic unit and a card reader

| 1(ii) | Which of the following controls the process of interaction between the user and the operating system? | 1 | CO1 |

    a. User interface
    b. Language translator
    c. Platform
    d. Screen saver

| 1(iii) | The first computers were programmed using | 1 | CO2 |

    a. assembly language
    b. machine language
    c. source code
    d. object code

| 1(iv) | Which of the following statements is true ? | 1 | CO5 |

    a. Minicomputer works faster than Microcomputer
    b. Microcomputer works faster than Minicomputer
    c. Speed of both the computers is the same
    d. The speeds of both these computers cannot be compared with the speed of advanced

| 1(v) | What type of resource is most likely to be shared common resource in a computer network? | 1 | CO3 |

    a. Printers
    b. Speakers
    c. Floppy disk drives
    d. Keyboards

| 1(vi) | CD-ROM stands for | 1 | CO1 |

    a. Compactable Read Only Memory
    b. Compact Data Read Only Memory
    c. Compactable Disk Read Only Memory
    d. Compact Disk Read Only Memory

1(vii)	ALU is
	   a. Arithmetic Logic Unit
	   b. Array Logic Unit
	   c. Application Logic Unit
	   d. None of above
			1	CO3

1(viii)	VGA is
	   a. Video Graphics Array
	   b. Visual Graphics Array
	   c. Volatile Graphics Array
	   d. Video Graphics Adapter
			1	CO4

1(ix)	The first-fit algorithm can be used for
	   a) linked allocation of memory
	   b) indexed allocation of memory
	   c) contiguous allocation of memory
	   d) all of the above
			1	CO1

1(x)	A computer cannot 'boot' if it does not have the
	   a. Compiler
	   b. Loader
	   c. Operating System
	   d. Assembler
			1	CO3

1(xi)	Time sharing operating system has
	   a. High throughput
	   b. Low execution time
	   c. Faster I/O
	   d. None of these
			1	CO1

GROUP – B
(Short Answer Type Questions)
(Answer any *three* of the following) **3 x 5 = 15**

		Marks	CO No
2.a)	What do you mean by PCB?	3	CO2
2.b)	Where the PCB can be used? Explain.	2	CO5

3	Consider the following page reference string
	    7,0,1,3,0,2,0,4,3,2,0,2,3,1,3,0,1,7,0,1
	  Assume that the number of frames= 4.
	  Calculate the page fault rate considering LRU algorithm
		5	CO3

4.	Explain the difference between long term and short term and medium term schedulers.	5	CO5
5	Explain the Round Robin scheduling algorithm with a suitable example	5	CO2
6.a)	What is a process?	2	CO5
6.b)	Draw and explain process state diagram.	3	CO3

GROUP – C
(Long Answer Type Questions)
(Answer any *three* of the following)   **3 x 15 = 45**

		Marks	CO No
7.a)	What is a Virtual Memory? Discuss the benefits of virtual memory technique.	8	CO3
7.b)	What is Thrashing? What is the cause of Thrashing? How does the system detect Thrashing? What can the system do to eliminate this problem?	7	CO2
8.a)	What is a Critical Section problem? Give the conditions that a solution to the critical. section problem must satisfy.	8	CO4
8.b)	What is Dining Philosophers problem? Discuss the solution to Dining philosopher's problem using monitors	7	CO4
9.a)	What is a deadlock? How deadlocks are detected?	5	CO2
9.b)	Explain the Resource-Allocation-Graph algorithm for deadlock avoidance	5	CO2
9.c)	What is Compaction?	5	CO3
10.a)	What is a semaphore? List the types of semaphores and Show that, if the wait() and signal() semaphore operations are not executed atomically, then mutual exclusion may be violated.	6	CO5
10.b)	Discuss the Bounded-Buffer problem	5	CO3
10.c)	State the Critical Section problem. Illustrate the software based solution to the Critical Section problem.	4	CO5
11.	Write short notes on any *three* of the following:	3x5	
11.a)	Time Sharing System	5	CO2
11.b)	Semaphore	5	CO3
11.c)	FCFS	5	CO4
11.d)	SCAN	5	CO5
11.e)	Paging	5	CO4