MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY ,WEST BENGAL
SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY
END SEMESTER EXAMINATION

SIST/*MCA/SEM- 2ND/MCAC202*/2022-23

JUNE– 2023

PAPER NAME: Operating Systems | *PAPER CODE: MCAC202*

SEMESTER : 2

Time : 3 Hours | 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)

1	**Choose the correct alternatives of the following : Any *ten***	**10 ×1 = 10**			
		MARKS	CO	PO	BL
i)	Which of the following is not an operating system?	**1**	CO1	1,7,12	BL2
a.	Windows				
b.	Linux				
c.	Oracle				
d.	DOS				
ii)	What is the full name of FAT	1	CO5	1,2,12	BL4
a.	File attribute table				
b.	File allocation table				
c.	Font attribute table				
d.	Format allocation table				
iii)	When does page fault occur?	1	CO4	1,2,3	BL3
a.	The page is present in memory.				
b.	The deadlock occurs.				
c.	The page is not present in memory.				

d.	The buffering occurs				
iv)	Banker's algorithm is used?	1	CO3	1,2,3,4	BL5
a.	To prevent deadlock				
b.	To deadlock recovery				
c.	To solve the deadlock				
d.	None of these				
v)	If the page size increases, the internal fragmentation is also?..	1	CO6	1,2,12	BL4
a.	Decreases				
b.	Increases				
c.	Remains constant				
d.	None of these				
vi)	Where are placed the list of processes that are prepared to be executed and waiting	1	CO1	1,7,12	BL2
a.	Job queue				
b.	Ready queue				
c.	Execution queue				
d.	Process queue				
vii)	What type of scheduling is round-robin scheduling	1	CO2	1,2,3,4	BL3
a.	Linear data scheduling				
b.	Non-linear data scheduling				
c.	Preemptive scheduling				
d.	Non-preemptive scheduling				
viii)	Which conditions must be satisfied to solve a critical section problem?	1	CO3	1,2,3,4	BL5
a.	Bounded Waiting				
b.	Progress				
c.	Mutual Exclusion				
d.	All of these.				

ix)	Which of the following file systems is supported by the windows OS?	1	CO4	1,2,3	BL3
a.	NTFS				
b.	FAT32				
c.	exFAT				
d.	All of the these				
x)	What type of memory stores data in a swap file on a hard drive?	1	CO5	1,2,12	BL4
a.	Secondary memory				
b.	Virtual memory				
c.	Low memory				
d.	RAM				
xi)	Which of the following "semaphore" can take the non-negative integer values?	1	CO4	1,2,3	BL3
a.	Binary Semaphore				
b.	Counting Semaphore				
c.	Real Semaphore				
d.	All of the these				

GROUP – B

(Short Answer Type Questions)

Answer the following. **3 ×5 = 15**

		MARKS	CO	PO	BL
2.a.	Write down the needs of an operating system?	**5**	CO 1	1,7,12	BL2
	OR				
2.b.	Explain various process states.	**5**	CO 2	1,2,3,4	BL3
3.a.	How does virtual memory work? Define demand paging.	**2+3**	CO 4	1,2,3	BL3

	OR				
3.b.	Justify Turn Variable method supports mutual exclusion and progress or not.	5	CO 3	1,2,3,4	BL5
4.a.	Write down the goals of the security system.	5	CO 5	1,2,12	BL4
	OR				
4.b.	Write advantages and disadvantages of Distributed Systems.	5	CO 6	1,2,12	BL4

GROUP – C

(Long Answer Type Questions)

Answer the following. **3 ×15 = 45**

		MARKS	CO	PO	BL
5.a.i.	How do you differentiate Multiprogramming and Multitasking operating systems?	5	CO1	1,7,12	BL2
ii.	Compare windows and Linux os	5			
iii.	Write down different kinds of system calls.	5			
	OR				

5.b.i.	Consider the set of 6 processes whose arrival time and burst time are given below- **Process Id** / **Arrival time** / **Burst time** P1 / 0 / 7 P2 / 1 / 5 P3 / 2 / 3 P4 / 3 / 1 P5 / 4 / 2 P6 / 5 / 1 If the CPU scheduling policy is shortest remaining time first, calculate the average waiting time and average turnaround time.	7	CO 2	1,2,3,4	BL3
ii.	Consider a system that contains five processes P1, P2, P3, P4, P5 and the three resource types A, B and C. Following are the resource types: A has 10, B has 5 and the resource type C has 7 instances. **Process** / **Allocation** A B C / **Max** A B C / **Available** A B C P1 / 0 1 0 / 7 5 3 / 3 3 2 P2 / 2 0 0 / 3 2 2 P3 / 3 0 2 / 9 0 2 P4 / 2 1 1 / 2 2 2 P5 / 0 0 2 / 4 3 3 **Answer the following questions using the banker's algorithm:** 1. What is the reference of the need matrix? 2. Determine if the system is safe or not.	8			

6.a.i	Consider the following page reference string 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	5+5+5	CO 4	1,2,3	BL3
	OR				
6.b.i	Given memory partitions of 100 K, 500 K, 200 K, 300 K and 600 K (in order) how Would each of the first fit, best fit and worst fit algorithms workplace processes of 212 K, 417K, 112 K and 426 K (in order)? Which algorithm makes the most efficient use of memory?	6	CO 3	1,2,3,4	BL5
ii	Write various file allocation methods.	9			
7.a.i.	Briefly explain the various kinds of program threats and system threats.	10	CO 5	1,2,12	BL4
ii.	How to ensure operating system security?	5			
	OR				
7.b.i.	Describe the different types of multiprocessing os.	7	C6	1,2,12	BL4
ii.	Write various characteristics of Distributed System.	5			
iii.	Write some applications area of Distributed System.	3			