

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER INTEGRATED MCA DEGREE EXAMINATION (R), MAY 2023 (2020 SCHEME)

Course Code: 20IMCAT206

Course Name: Operating Systems

Max. Marks: 60

Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. Define an operating system with the help of a neat diagram.
2. List and explain any three functions of an operating system.
3. Describe the life cycle of a process with the help of a process state transition diagram.
4. Describe the different criteria for scheduling.
5. Explain inter-process communication models.
6. What is meant by critical section problem? List the solutions.
7. Define swapping with the help of a diagram.
8. Explain demand paging with the help of a diagram.
9. List and explain any three attributes of a file.
10. Describe different file access methods.

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

11. Which are the different types of operating system? Explain any three. (6)

OR

12. Explain various categories of system calls with examples. (6)

MODULE II

13. Explain FCFS and round robin algorithm with the help of examples. (6)

OR

14. a) Define process control block (PCB). (2)
b) Draw the Gantt-chart representation of the below problem using the pre-emptive shortest job first algorithm. (4)

Process	Arrival Time	Burst Time
P0	3	3
P1	2	4
P2	0	6
P3	1	2

MODULE III

15. What is a deadlock? Explain the necessary conditions for occurring deadlock. (6)

OR

16. Consider a system with five processes P_0 through P_4 and three resource types A, B, and C. Resource type A has ten instances, resource type B has six instances, and resource type C has seven instances. Suppose that, at time T_0 , the following snapshot of the system has been taken. Find the need matrix and safe sequence of the below situation using Banker's algorithm.

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	1	1	2	4	3	3	2	1	0
P1	2	1	2	3	2	2			
P2	4	0	1	9	0	2			
P3	0	2	0	7	5	3			
P4	1	1	2	1	1	2			

(6)

MODULE IV

17. Explain paging with the help of a neat diagram. (6)

OR

18. Explain FIFO and LRU algorithms with examples. (6)

MODULE V

19. Elaborate on contiguous and linked file allocation methods with the help of a neat diagram. (6)

OR

20. Explain the following disk scheduling algorithms with suitable examples. (6)
- FCFS
 - SSTF
 - SCAN.
