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## SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER INTEGRATED M.C.A DEGREE EXAMINATION (R), JULY 2022

(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. What is an Operating system?
2. List and explain any three types of operating systems.
3. Define a process with the help of a process state transition diagram.
4. Draw the Gantt-chart representation of the below problem using Non-Pre-emptive and SJF Pre-emptive scheduling.

Process	Arrival Time	Burst Time
P0	3	2
P1	2	3
P2	0	8
P3	1	6

5. What is deadlock? Explain the necessary conditions for deadlock.
6. Explain Critical-Section Problem. What are the requirements needed to solve a critical section problem?
7. What is Demand paging?
8. Define segmentation. Explain the use of segment table.
9. Explain the linked file allocation method with the help of a diagram.
10. List and explain any three common file attributes.

### PART B

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

#### MODULE I

11. Explain different functions of the operating system. (6)

OR

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

#### MODULE II

13. Describe round robin scheduling algorithm with an example. (6)

OR

14. Explain multilevel queue scheduling algorithm with the help of an example. (6)

**MODULE III**

15. Explain resource-allocation graph in detail. Explain its components with an example. (6)

**OR**

16. Consider a system with five processes P0 through P4 and three resource types A, B, and C. Resource type A has ten instances, resource type B has five instances, and resource type C has seven instances. Suppose that, at time T0, the following snapshot of the system has been taken. Find the safe sequence of the below situation using Banker's algorithm.

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

(6)

**MODULE IV**

17. What is Paging? Explain with the help of a neat diagram. (6)

**OR**

18. Explain any two page replacement algorithms with examples. (6)

**MODULE V**

19. Describe the following disk scheduling algorithms with examples. (6)
- FCFS
  - SSTF
  - SCAN

**OR**

20. Elaborate on different file operations and file types. (6)

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