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SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)
(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION(R), MAY 2024
Electronics and Communication Engineering
(2020 SCHEME)

Course Code	:	**20ECT424**
Course Name	:	**Real Time Operating Systems**
Max. Marks	:	**100**

Duration:3 Hours

PART A
(Answer all questions. Each question carries 3 marks)

1. Explain the need for inter process communication.

2. Enumerate various operating system service goals.

3. Compare user level and kernel level threads.

4. Explain about multiprocessing.

5. Draw and explain the state diagram for a message queue.

6. Compare exceptions and interrupts.

7. Describe the rate monotonic scheduling algorithm.

8. Explain about periodic task scheduling. List the two methods of periodic task scheduling.

9. List any three features of RT Linux real time operating system.

10. Enumerate the important characteristics of Free RTOS.

PART B
(Answer one full question from each module, each question carries 14 marks)
MODULE I

11. Explain how processes are created in an operating system. Draw and explain a typical process state diagram.   14

OR

12. With examples, explain the process of creating processes and threads in an operating system. Also explain about the process control blocks and process IDs.   14

MODULE II

13. a. Compare FCFS and SJF scheduling algorithms.   6
    b. Three processes with process IDs P1, P2, P3 with estimated completion time 10, 2, 4   8
    milliseconds respectively enters the ready queue together in the order P1, P2, P3. Calculate the waiting time and Turn Around Time for each process and the average waiting time and Turn Around Time in FCFS scheduling.

OR

14. Explain round robin and priority scheduling algorithms with suitable examples.   14

MODULE III

15. a. Explain in detail about events used for interprocess communication. 8
    b. Enumerate signal operations. 6

OR

16. a. Enumerate the various types of semaphores. 8
    b. Discuss about single shared resource access synchronization. 6

MODULE IV

17. a. Illustrate the Earliest Deadline Due scheduling algorithm. 6
    b. Schedule the following using EDD algorithm. 8

	J1	J2	J3	J4	J5	J6
C_i	1	2	1	2	1	2
d_i	3	2	4	7	5	9

OR

18. Analyze the function of Latest Deadline First scheduling algorithm with step by step directed   14
    acyclic graph representation an example having six processes(P1, P2, P3, P4 and P5). Conditions:
    P3 and P5 must be completed only after P2; P2 and P4 must be completed only after P1. Deadlines
    and completion times may be assigned by yourself.

MODULE V

19. Compare and contrast the features and application of RT Linux and pSOS. 14

OR

20. Use semaphore functions to create a sample code to explain the implementation of counting   14
    semaphores in MicroC/OS-II.

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