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SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), MAY 2023
VLSI AND EMBEDDED SYSTEMS
(2021 Scheme)

Course Code: 21VE203

Course Name: Embedded Operating System and RTOS

Max. Marks: 60   **Duration: 3 Hours**

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

1. Compare SRAM and DRAM.
2. Draw the architecture of any one operating system.
3. What is meant by non-preemptive scheduling and preemptive scheduling methods? Give examples of both.
4. Describe the open, connect and write functions of pipe devices.
5. Enumerate various device driver ISR functions.
6. Describe about Synchronous and Asynchronous I/O operations.
7. List and define any six interrupt handling functions in VxWorks.
8. Describe about Board Support Packages.

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

MODULE I

9. With the help of use case diagrams, design an embedded device to monitor the oxygen level, heart beat and temperature of a patient.   (6)

OR

10. Enumerate the essential components of tool chain. Analyze how the target file is generated from source code with the help of tool chain.   (6)

MODULE II

11. With the help of an example, explain how a task is different from a thread?   (6)

OR

12. a) What are the needs for Inter Process Communication?   (3)
    b) List the various IPC methods used in an Operating System.   (3)

MODULE III

13. Draw and explain about the Task State diagram of Linux Operating System. (6)

OR

14. With neat sketches, explain Earliest Deadline First scheduling method. (6)

MODULE IV

15. What is the need for event functions? List and explain various event functions. (6)

OR

16. Describe any two methods of handling Interrupt service routines in an RTOS environment. (6)

MODULE V

17. Analyze how virtual memory address is mapped to physical memory space with the help of an example. (6)

OR

18. a) Describe swapping process. (3)
    b) Enumerate various memory segments in and Operating System. (3)

MODULE VI

19. a) What are sockets functions? (3)
    b) Enumerate socket functions in VxWorks. (3)

OR

20. Write an example program to implement a message queue in VxWorks. (6)

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