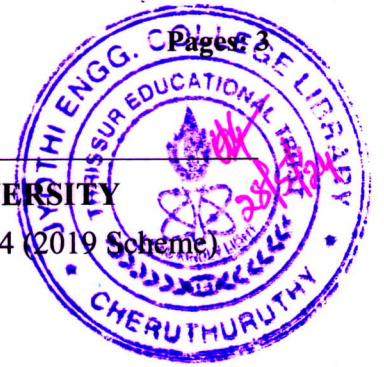


B

0400CST464052301



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Eighth Semester B.Tech Degree (R, S) Examination May 2024 (2019 Scheme)

Course Code: CST464

Course Name: EMBEDDED SYSTEMS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

- | | | Marks |
|----|--|-------|
| 1 | Explain the working of Brown-out Protection Circuit. | (3) |
| 2 | Write about the Classification of Embedded System. | (3) |
| 3 | Illustrate the sequential program model for seat belt warning system. | (3) |
| 4 | Explain concurrent program model with example. | (3) |
| 5 | Differentiate General Purpose Operating System and Real Time Operating System. | (3) |
| 6 | Explain any three non-functional requirements for selection of RTOS. | (3) |
| 7 | Write short notes on In Application Programming (IAP). | (3) |
| 8 | Compare Iterative and Incremental Life cycle model. | (3) |
| 9 | Draw use case diagram for IoT smart appliance. | (3) |
| 10 | Identify the components required to design a Smart watch. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- | | | |
|----|---|------|
| 11 | a) Differentiate between PLD and ASIC. | (4) |
| | b) Describe various External Communication Interface used in Embedded system. | (10) |

OR

- | | | |
|----|--|------|
| 12 | a) Elaborate Embedded System Design Process steps with appropriate diagrams. | (10) |
| | b) Explain the role of watchdog timer in an embedded system. | (4) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Describe the fundamental issues in hardware software co-design. | (9) |
| | b) Identify in which situation CDFG model is selected for designing Embedded system. | (5) |

OR

- 14 a) Explain about Traditional Development method. Suggest Which method is suitable for designing Embedded System. (6)
- b) Imagine yourself as an embedded system developer. If a client approaches you for designing automated Tea/Coffee vending machine:
- a) Develop requirements of the machine.
- b) Draw Finite State Machine diagram for automated Tea/ Coffee vending machine. (8)

Module III

- 15 a) Compare preemptive and non preemptive SJF scheduling. (6)
- b) Explain how Remote Procedure Call and Message Queue initiate Task communication. (8)

OR

- 16 a) Three Processes with process Ids P1, P2, P3 with estimated completion time 10, 5, 7 milliseconds and priorities 0, 3, 2(0-highest priority, 3-lowest priority) respectively enters the ready queue together. Calculate the waiting time and Turn Around Time (TAT) for each process and the Average Waiting Time and Average Turn Around Time (Assume there is no I/O waiting for the processes) in priority based scheduling algorithm. (6)
- b) Explain any two Task Synchronization issues. (8)

Module IV

- 17 a) An Embedded product under consideration is very complex in nature and there is a possibility for change in requirements of the product. Also the risk associated with the development of this product is very high. Which is the best suited life cycle method to handle this product development? Justify your answer. (6)
- b) Discuss about various Embedded firmware design approaches. (8)

OR

- 18 a) Explain Conceptualization, Analysis and Design phases of EDLC model with neat diagrams. (6)
- b) Describe the various conversion steps involved in the High level based firmware in to corresponding Machine language. (8)

Module V

- 19 a) Design a Smart Home using IOT with the help of UML diagrams. (5).

- b) Explain CAN bus vehicular network in detail with diagram. Compare CAN bus Architecture with LIN Architecture. (9)

OR

- 20 a) Identify the components required to build an Automated Energy Metre Reading system and design it with these components. (8)
- b) Write short notes on (6)
1. ZigBee
 2. Timewheels
