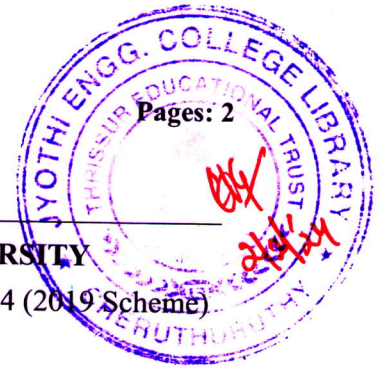Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree (S, FE) Examination January 2024 (2019 Scheme)

Course Code: RAT206

Course Name: MICROCONTROLLERS AND EMBEDDED SYSTEMS

Max. Marks: 100   Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

Marks

1.	Differentiate between RISC and CISC architectures.	3
2	Explain about data pointer in 8051.	3
3	Describe the function of TCON special function register.	3
4	Explain PCON special function register.	3
5	List the general features of an embedded system.	3
6	Explain the concept of SoC.	3
7	Describe the basic commands in Arduino.	3
8	List the main features of Atmega328.	3
9	Explain the POSIX standard.	3
10	Compare I2C and SPI protocols.	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	Explain the architecture of 8051 microcontroller with neat diagram	10
	b)	Describe the different types of addressing modes in 8051.	4
12	a)	Explain the memory organization in 8051 microcontrollers.	6
	b)	Write an assembly language program to add the first 20 natural numbers and store the sum in a RAM location.	8

Module -2

13	Explain the interfacing of an LED with 8051 microcontroller using a connection diagram. Write an embedded C program to blink an LED with 8051 microcontroller.	14
14	Explain LCD interfacing with 8051 microcontroller. Write an embedded C program to send letters B, C and E to the LCD using delays.	14

Module -3

15 a) Describe middleware and device drivers in embedded system software. 7

    b) Explain about memory and device peripherals in embedded systems. 7

16 Explain Tool chain in embedded system architecture. 14

Module -4

17 Draw the board level schematic representation of Ardunio Uno and explain each component. 14

18 Explain in detail the interfacing of temperature sensor LM 35 with relevant program and circuit connection. 14

Module -5

19 a) Explain the functional layers of a computer system. 4

    b) Describe the functions performed by an operating system. 10

20 Explain RTOS and compare RTOS with General purpose OS. 14

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