Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Regular and Supplementary Examination June 2023 (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	Compare Harvard and Von Neumann Architecture	(3)
2	Explain the instruction MOVC and MOVX Command	(3)
3	What is MAX 232? What is the need?	(3)
4	What is GPIB?	(3)
5	Define embedded system. Why C language is used in embedded system?	(3)
6	What is System on Chip (SOC)? Give an example.	(3)
7	List out the three important parts of Arduino?	(3)
8	Write the basic commands for Arduino.	(3)
9	Define CPU scheduling.	(3)
10	Define process, task and task states.	(3)

PART B

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

Module -1

11	a)	Draw the Pin diagram of 8051 microcontroller and explain the pin signals.	(14)
12	a)	Draw and briefly explain the memory organization in 8051 microcontroller.	(4)
	b)	List out the arithmetic operations of 8051 microcontroller and explain with an example.	(10)

Module -2

13	a)	Describe the operation and functions of the different modes of timer in 8051 microcontroller with a neat diagram.	(10)
	b)	State the alternate functions of port 3 of 8051 microcontroller	(4)
14		Explain how switches and LEDs are interfaced with 8051 microcontroller with a neat diagram and write the program to flash the LED.	(14)

Module -3

15		With a neat diagram, explain the hardware, software components and its functions of digital camera.	(14)
16		Explain the design process of embedded system in detail.	(14)

Module -4

17	a)	Write the features of Arduino	(7)
	b)	Explain about General purpose Input, Output module of Arduino with an example.	(7)
18	a)	Write a program to monitor the room temperature by interfacing LM35 with Arduino uno board.	(14)

Module -5

19	a)	Explain the following scheduling algorithms a) Priority Scheduling b) Round robin Scheduling	(8)
	b)	Write the characteristics of real time operating system	(6)
20	a)	With a neat diagram, explain how SPI helps in communication	(10)
	b)	List out the issues in real computing.	(4)

***