Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Examination June 2022 (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	Define baud rate	3
2	List few features of 8051 microcontroller?	3
3	Name the interrupts of 8051 microcontroller.	3
4	What is the various programmed data transfer method?	3
5	What is an embedded system? What are the components of embedded system?	3
6	What is watch dog timer?	3
7	What is Arduino?	3
8	Why we should use Arduino?	3
9	What is called RTOS?	3
10	What do you meant by kernel function?	3

PART B

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

Module -1

11	a)	Briefly explain the registers used in the 8051 microcontroller	8
	b)	Draw the pin diagram of 8051 microcontroller.	6
12	a)	Explain briefly the five addressing modes of 8051 with example for each.	10
	b)	After reset, the contents of internal memory of 8051 with address 0AH and 0BH contains data 22H and 33H, respectively. Sketch the contents of internal memory from address 07H to 0BH and the value of register SP, after executing the following code: PUSH 0AH : MOV 81H, #0BH POP 09H.	4

Module -2

13	a)	Explain briefly the interrupts of 8051, indicate their vector addresses.	9
	b)	Interface an LCD display to 8051 write an ALP to display the message 'VERY GOOD'.	5
14	a)	What is the difference between timer and counter operation of 8051? How to start/stop the timer/counter of 8051 when i) GATE control is not used ii)GATE control is used	10
	b)	Explain the function of the pins of 9-pin RS-232 connector.	4

Module -3

15	a)	Explain in detail the design process in embedded system.	8
	b)	List the hardware units that must be present in the embedded systems.	6
16	a)	Define kernel? What are the different functions handled by a general purpose kernel?	7
	b)	Explain the memory management units and address translation techniques.	7

Module -4

17	a)	Briefly explain the architecture of Arduino board with neat block diagram	14
18	a)	Briefly explain the how the stepper motor controlled with aid of Arduino	14

Module -5

19	a)	What is an Embedded Operating System? Briefly explain the types of embedded operating system.	14
20	a)	Briefly explain the SPI and USB protocol with example	14

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