

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

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



**Course Code: MRT206**

**Course Name: MICROPROCESSOR & EMBEDDED SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*(Answer all questions; each question carries 3 marks)*

		Marks
1	Mention a few peripheral I/O interface adapters for a microprocessor.	03
2	Give an example each for data transfer, arithmetic/logical, branching instructions.	03
3	Mention how I/O devices are classified for embedded system.	03
4	Mention the seven products described by the Waterfall Model.	03
5	Show the status of the CY, AC and P flag after the addition of 88H and 93H in the following instructions. MOV A, #88H ADD A, #93H	03
6	Define Hard and Soft real-time system.	03
7	List any two features of SFR in 8051 microcontroller.	03
8	Compare AJMP, SJMP and LJMP instruction of 8051.	03
9	Point out the important applications of the keyword "static" in embedded C.	03
10	Draw the timing diagram for Memory Read operation in 8085 microprocessor.	03

**PART B**

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

**Module -1**

11	a) Discuss the functions of SIM and RIM instructions in 8085.	07
	b) Explain flag register in 8085 processor.	07
12	a) Write an Assembly language program for to sort an array in descending order in 8085.	10
	b) Mention the specific changes in the above program if the same must be done for sorting the array in ascending order.	04

**Module -2**

- 13 a) Discuss the necessity of interfacing in 8085 microprocessor with an example. 07  
b) Draw the timing diagram of the given instruction in 8085: MOV B, C 07
- 14 a) Explain BSR mode of 8255 with an example. 07  
b) Explain input output control word format of 8255. Write control word of 8255 to initialize Port A as input port, Port B and C as output port, Group A and B in Mode 0. 07

**Module -3**

- 15 a) Discuss the situations where Waterfall Model is most appropriate. 07  
b) State advantages and disadvantages of an embedded system. 07
- 16 a) Explain the components, characteristics and applications of an embedded system. 07  
b) Describe design metrics and optimization challenges for embedded system. 07

**Module -4**

- 17 a) Briefly explain the addressing modes of 8051 with example for each. 07  
b) Discuss in detail the differences between Asynchronous and Synchronous Communication. 07
- 18 a) Compare Microprocessor and Microcontroller. 04  
b) Write an assembly language program for 8051 microcontroller for finding the largest number in a given set of 05 numbers. (Assume suitable data/memory addresses). 10

**Module -5**

- 19 a) Write a Program to display the numbers from '00 to 10' in 7 segment displays. 07  
b) Write a C program to send string "Hello" through serial port. 07
- 20 Explain with appropriate block diagram to interface an 8-bit ADC with 8085 Microprocessor. Write a program to convert an analog signal to digital (Assume suitable value for analog signal) 14

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