



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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2022 (2019 Scheme)

**Course Code: CST 307****Course Name: MICROPROCESSORS AND MICROCONTROLLERS**

Max. Marks: 100

Duration: 3 Hours

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

Marks

- |    |  |   |
|----|--|---|
| 1  | What is pipelined architecture? How is it implemented in 8086?   | 3 |
| 2  | Compare the architectural and signal difference between 8086 and 8088.   | 3 |
| 3  | Write any three addressing mode of 8086 with example and write the effective address calculation in each.  | 3 |
| 4  | Write the functions performed by PUSH and POP instructions in 8086 with appropriate diagram.   | 3 |
| 5  | What is an interrupt vector table? Explain its structure in 8086.  | 3 |
| 6  | Write notes on the following based on 8086:<br>a. software interrupt<br>b. hardware interrupt<br>c. nested interrupt   | 3 |
| 7  | Write the function of the following control signals in 8255.<br>RD, WR, A <sub>0</sub> , A <sub>1</sub> , RESET, CS  | 3 |
| 8  | Draw and explain the operational waveform of 8254 in MODE 0 operation.   | 3 |
| 9  | Draw and explain the format of program status word in 8051.  | 3 |
| 10 | Write an assembly language program for 8051 to compute $x$ to the power $n$ where both $x$ and $n$ are 8-bit numbers given by user and the result should not be more than 16 bits. | 3 |

**PART B***(Answer one full question from each module, each question carries 14 marks)***Module -1**

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|----|---|----|
| 11 | Draw and discuss the internal block diagram of 8086.  | 14 |
| 12 | With a neat sketch explain the read and write cycle timing diagram of 8086 in minimum mode. | 14 |

**Module -2**

- 13 Write an assembly language program to find the largest and smallest number from an unordered array of 16-bit numbers. Assume the array contains 15 numbers and the starting location as 2500H. Draw the flowchart for the program. 14
- 14 Write an assembly language program to find the total number of even and odd numbers from an array of 16-bit numbers. Assume the array contains 20 numbers and the starting location as 5500H. Draw the flowchart for the program. 14

**Module -3**

- 15 a) Explain the interrupt cycle of 8086. 8
- b) Differentiate maskable and non-maskable interrupts in 8086. 6
- 16 Draw the architectural block diagram of 8259A and explain the function of each block. 14

**Module -4**

- 17 Explain the different modes of operation of 8255 in detail. 14
- 18 Draw and explain the internal architecture of 8257. 14

**Module -5**

- 19 a) Explain the addressing modes of 8051 with example. 10
- b) Write an assembly language program for 8051 to perform addition of two 2x2 matrices. 4
- 20 a) Explain the interrupt and stack structure of 8051. 10
- b) Write an assembly language program for 8051 to find the transpose of a 2x2 matrix. 4

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