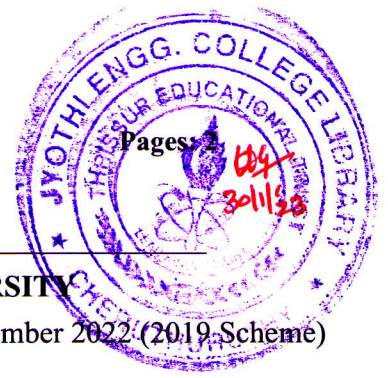


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Reg No.: _____

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:
a. software interrupt
b. hardware interrupt
c. nested interrupt | 3 |
| 7 | Write the function of the following control signals in 8255.
RD, WR, A ₀ , A ₁ , 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

- | | | |
|----|---|----|
| 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
