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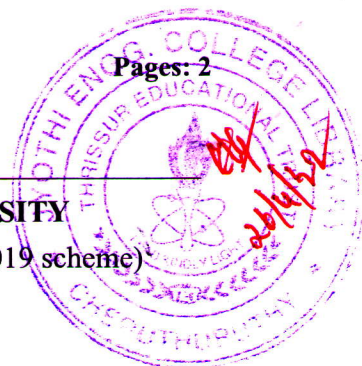
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Fifth Semester B.Tech Degree Examination December 2021 (2019 scheme)



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 | List features of 8085 microprocessor. | 3 |
| 2 | The value of Code Segment (CS) Register is 3054H and the value of different registers is as follows: BX: 4025H , IP: 1580H , DI: 5467H.
Calculate the physical address of the next instruction to be fetched. | 3 |
| 3 | State the significance of assembler directives in assembly language program and provide two examples for it. | 3 |
| 4 | List the 8086 instructions used for transferring data between registers, memory, stack, and I/O devices. | 3 |
| 5 | Explain how the INT n instruction finds the starting address of its interrupt service routine in IVT. | 3 |
| 6 | Classify various categories of interrupts available in 8086. | 3 |
| 7 | Interpret the mode and configurations of 8255 after its control word register is loaded with 86H. | 3 |
| 8 | Explain the features of 8257 DMA controller. | 3 |
| 9 | Differentiate between Microprocessors and Microcontrollers. | 3 |
| 10 | List the IO ports available in 8051. | 3 |

PART B

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

Module -1

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|----|---|----|
| 11 | a) Draw and explain the internal architecture of 8086. | 10 |
| | b) Give the architectural and signal differences between 8086 and 8088. | 4 |
| 12 | a) Draw the Memory Read and Write timing diagrams of 8086 in Minimum mode. | 9 |
| | b) Draw the structure of 8086 flag register and mention the purpose of each flag. | 5 |

Module -2

- 13 a) Discuss addressing modes supported by 8086 with suitable examples. 9
 b) Discuss about the data transfer instructions with examples. 5
- 14 a) Assume that 8086 registers having values AX=0030H, BX = 0031H, CX=0032H, DX=0033h, Flag – 0000H. 7
 Predict the values of Registers and Flags [AX, BX, CX, DX, Carry flag (CF), Zero Flag (ZF), Sign Flag (SF)] after the execution of following instructions:
 (Assume each instruction are being executed independently)
 i) ROR AX,04h ii) CMP BX, CX iii) XCHG CX, DX iv) AND AX, BX
 v) LOOP Addr vi) XOR AX, AX vii) STC
 Hint – Draw a table with columns *Instructions, AX, BX, CX, DX, CF, ZF, SF* and fill the answers.
- b) Write an 8086-program to find the largest among 'n' numbers (each numbers and count are of one byte only). 7
 Kindly assume that the size of array(count) stored in 2000h, and the numbers(array) stored from 2001h onwards up to 'n' continues locations.

Module -3

- 15 a) Explain the stack structure of 8086. 4
 b) Interface two 32K X 8 EPROMS and two 32K X 8 RAM chips with 8086, microprocessor and draw the suitable circuit showing their interfacing. 10
- 16 a) Draw and explain the internal architecture of 8259. 8
 b) State the purpose of Interrupt Vector Table of 8086 and explain its structure. 6

Module -4

- 17 a) Explain the 8254 programmable timer and its operation modes with a neat block diagram. 9
 b) Explain different modes of operation of 8255 PPI. 5
- 18 a) With a neat diagram describe the architecture of 8255 PPI. 8
 b) Give the registers available in 8257 DMA Controller. Explain their functions. 6

Module -5

- 19 a) Explain the Internal RAM organization of 8051 with neat diagram. 8
 b) List any four addressing modes supported by 8051 microcontrollers with one example each. 6
- 20 a) Explain internal architecture of 8051 with neat diagram. 9
 b) State the name and purpose of any 6 special function registers (SFRs) of 8051 microcontroller. 5
