Ref. No.: Ex//ET/T/311/2019

BACHELOR OF ENGG. (E. T. C. E) EXAM., 2019
(3rd Year, 1st Semester Examination, 2019)

MICRPROCESSORS & MICROCONTROLLERS

Time: Three Hours Full Marks: 100

Answer ALL the Questions
(All Parts of the same question must be answered at one place only)

Module I

1. (a) (i) Define the term Microprocessing Unit (MPU). As an MPU, what are the limitations of 8085 Microprocessor?
(ii) Let the (A) = AAH. What will be the (P) Flag?
(iii) What does PC and SP stand for? What are their respective functions?
(iv) A certain processor has 16-bit data bus. Calculate its addressing capacity.
(b) (i) What is the function & use of 'READY' signal of 8085 MPU.
(ii) Name the Interfacing the device that are used with the Input Port and Output Port respectively and explain the operation of the respective interfacing devices with the relevant schematic.
(iii) In the memory mapped I/O scheme, can an I/P and O/P Port have the same address. Explain the reason for the same. [(3+1+3+1)+(4+6+2)]

Module II

2. (a) (i) What is a stack? When & How (ie. the instructions) does a Programmer use the Stack?
(ii) How does the 8085 MPU change the sequence of program execution with a JMP instruction? [(3+3)]
(b) A set of ten current readings are stored in memory locations starting from 9060H. The readings are expected to be positive ($\leq$ 127). Draw the flow chart and write an 8085 Assembly Language Program (ALP) to (i) Check each reading to determine whether it is positive or negative (ii) reject all the negative readings (iii) add all the positive readings and (iv) store the sum at 90FFH. Data (H): 28,D8,C2,21,24,30,2F,19,F2,9F [(6+8)]

Module III

3. (a) (i) Explain the steps in 8085 interrupt process with respect to INTR signal.
(ii) Is there a minimum pulse width required for INTR signal? [(12+2)]
(b) Write an 8085 ALP to enable all the interrupts. Explain the utility / function / format of the instruction used to enable all the 8085 interrupts. [(3+3)]

[Turn over

Module IV

4. (a) (i) Identify the elements of the 8255A Programmable Peripheral Interface (PPI) Chip. (ii) Explain 8255 PPI operation in BSR Mode with its control word format.
(b) (i) The A_7 line and A_6-A_2 lines of 8085 with inverter gates together forms the 6-input NAND Gate, and the output of this NAND Gate is connected to the 8255 PPI Chip Select (CS) pin. (ii) Consider that 8-Parallel DIP switches and LED Ports are to be interfaced with the 8255 PPI. Draw the complete 8255 PPI Chip Select logic and the I/O interfacing scheme. Write an 8085 ALP to read the DIP switches Port and display the same at LED Port. Show all the intermediate steps clearly.
(C) (i) Show / Describe the elements of the 8254 Programmable Interval Timer with their respective input and output signals. (ii) Identify the Mode 3 operation of 8254. [(2+2)+[(4+7)+(4+1)]

Module V

5. (a) Explain the 8085 Microprocessor based Temperature Control System with a neat Block Diagram, flow chart and the Assembly Language Program. [(4+5+7)]
(b) Name the widely used 8-bit Microcontroller family from Intel and list its features. [(1+3)]