Final Assessment Test – May 2024

Course: BECE204L - Microprocessors and Microcontrollers

Class / NBR(s): 5463 / 5466 / 5468 / 5470 / 5471 / 5474 / 5476 / 5478 / 5481 / 5483 / 5486 / 5488 / 5490 / 5494 / 5495 / 5497 / 5498 / 5500 / 5502 / 5503 / 5507 / 5619

Slot: C2+TC2

Time: Three Hours

Max. Marks: 100

- KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Elaborate the working of a general-purpose 8085 or 8086 microprocessor. Provide a neatly drawn block diagram and its description.

2. Array-1 has 5 unsigned numbers and array-2 has 6 unsigned numbers. They are stored in two different data segments. Write 8086 ALP to find the smallest number in array-1 and largest number in array-2. Calculate the average of these two numbers and store it in another data segment.

3. I) Describe the internal block diagram and operations of 8255 with necessary block diagram. [5]

II) If CS = 3000H, DS = 7000H, ES =2000H and SS = 5000H. Calculate the physical addresses corresponding to the give offset addresses. [5]

a) IP = 2000H
b) BX = 1000H
c) SI = 3000H
d) SP = 4000H
e) BP = 5000H

4.(a) Write an 8051 assembly language program to find the largest number in a given array of six numbers which are stored from external memory location 4000H onwards. Find the largest number of the array and store it at location 4017H.

OR

4.(b) Write 8051 assembly language program to convert 8-bit hexadecimal number to three-digit decimal number. Assume the hexadecimal number is stored in R0 and store the three-digit decimal number in R5, R6 and R7.

5. The text "SIMPLE INTERSET =" is present in the code (code memory) from 0100H onwards. Write 8051 ALP to calculate simple interest (SI) and transfer the text "SIMPLE INTERSET =" from the code memory to external memory from 0100H onwards. Followed by that transfer the calculated SI value to the next location of the external memory. Assume necessary input data present in data memory. (SI=PNR/100).

6.(a) Write an 8051 ALP language to generate a pulse waveforms with a duty cycle of 43% approximately (42.86%) in all the bits of the Port-1 without using timer. Don't assume the number of machine cycles for any instructions.

OR

6.(b) Write an 8051 ALP language which consists of a delay module DELAYX which can create a delay of x time units. Generate a periodic pulse waveform with frequency F = 1/(4x) and 50% duty cycle using DELAYX. Don't assume the number of machine cycles for any instruction.

7. Find the delay (D) generated by the timer-0 if it has the following settings TMOD = 01H, TH0 = 00H and TL0 = 00H. Write 8051 ALP to generate a pulse waveform with frequency f = 1/(2D) and duty cycle = 50% using timer-0 and simultaneously transfer data from Port-0 to Port-1.

   Assume XTAL = 11.0592 MHz.

8. Draw the block of the described system with required control signals. A temperature sensor is connected to analog input of an ADC, the 8-bit digital output lines of the ADC are connected to P1 of 8051 and 8-bit input of the DAC is connected to P0 of 8051. Write 8051 ALP to continuously get the data (C) from the ADC output, compute F = (9*C)/5 + 32 and send the result (F) to input of the DAC.

9. Describe the ARM dataflow model and registers with block diagram and explain the operations of individual blocks.

10. Write a simple ARM program to find $y = x^2 + 3x + 5$ where x is input stored in r0 register.

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