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**V 4565**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Fifth Semester

Mechatronics Engineering

EC 1318 — MICROPROCESSORS AND APPLICATIONS

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the main parts of a micro computer CPU module?
2. What is meant by an addressing mode?
3. How is an address decoder built?
4. What is meant by interrupt – driven I/O?
5. How is the 8257 programmed?
6. How does the programmable key board display controller connect to the processor?
7. Determine the control byte required for each of the following 8255 configurations.
  - (a) Set pc5 using bit set/reset mode.
  - (b) Port A=mode 1 output, Port B=mode 0 output, and Pc 0-2 inputs.
8. A certain 8 bit DAC has a full scale voltage rating 10V. What is the step size for this DAC?
9. Compare the functions of a open loop control to a closed loop control.
10. What are the major automotive applications of microprocessor control?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the pin configuration of 8085 and briefly explain the function of each pin. (12)
- (ii) Write an 8085 assembly language program to add two numbers of 8 bit data stored in memory 0700H and 0701H and to store the result in 0702H. (4)

Or

- (b) (i) Draw and explain the timing structure of basic instruction cycle timing of 8085 and show about at least six T state timings. (10)
- (ii) Write an 8085 assembly language program to add 32 bit number stored at 0700H through 0703H to the 32 bit number stored at 0704H through 0707H. The sum will be stored at 0708H through 070BH. (6)
12. (a) (i) Design a 8085 based system such that RAM from address 0000H to 7FFFH and ROM from B000H to FFFFH. What is the free space capacity? Draw the memory map and connection diagram. (10)
- (ii) A certain memory interface uses buffers into and off the system address, data and control busses. If the memory chips have a 150 ns access time, the address busses a 25 ns propagation delay time, and the data bus buffers a 30 ns propagation delay time, calculate the minimum access time necessary to avoid wait states. (6)

Or

- (b) (i) Name the different types of data transfer schemes with a tree structure and briefly discuss about each type. (12)
- (ii) What data is output by the following 8085 program to which ports? What is the output of the following 8085 program? Mention the output ports. (4)

MVI A, 3CH

OUT 27 H

OUT 28 H

HLT

13. (a) (i) Draw the functional block diagram of a programmable peripheral device and explain the function of each mode. (10)
- (ii) Describe the different modes of operation of a programmable interval timer (8253). (6)

Or

- (b) (i) Draw the functional block diagram of a programmable interrupt controller and explain its working. (10)
- (ii) Discuss briefly about the master mode operation of 8257 in a microprocessor interfaced function. (6)
14. (a) Draw a design of 8085 to 8255 memory mapped interface with port A (8255) of a matrix key connection of  $8 \times 2$  and port B with one common anode seven segment display with appropriate decoder logic circuitry and control signals. (16)

Or

- (b) Draw the functional block diagram of a 8279 and discuss about its initialisation commands. (16)
15. (a) Draw a block diagram of a microprocessor based temperature monitoring system and explain the function with display and limit switch operating algorithms. (16)

Or

- (b) With the help of model block diagram and flow chart. Explain the open loop and closed loop control system in a microprocessor application. (16)
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