FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2021
(CBCSS - PG)
CC19P PHY4 E20 – MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS
(Physics - Elective Course)
(2019 Admission - Regular)

Time: Three Hours   Maximum: 30 Weightage

Part A (Short answer questions)
Answer *all* questions. Each question carries 1 weightage.

1. Explain clearly the purpose of the following registers inside Intel 8085.

   a) Program Counter   b) Stack Pointer

   c) Instruction Register   d) Accumulator

2. Explain the various addressing modes in Intel 8085 citing one instruction for each mode.

3. With the help of a block diagram, show how one 8K PROM chip, four 8K RAM chips, one input and one output device can be interfaced for address decoding. Use 74LS138 decoder.

4. Draw the internal block diagram of Intel 8255 and list the functions associated with each block.

5. Sketch the block diagram for interfacing a seven segment LED display for displaying a single decimal digit. Mention the purpose of each block.

6. What do you mean by an embedded system? Give a brief account of any one application.

7. Explain the flags in a typical AVR status register.

8. Explain the format and use of the following AVR instructions.

   a) LDS   b) INC   c) CALL   d) CBI

(8 × 1 = 8 Weightage)

Part B (Essay questions)
Answer any *two* questions. Each question carries 5 weightage.

9. With the help of a labelled block diagram, discuss the internal architecture of Intel 8085.

10. Sketch the functional block diagram of Intel 8257 and explain its operation.

11. Discuss the internal structure and functions of AVR microcontroller.

12. Discuss the various I/O ports in a typical AVR microcontroller and their functional operations.

(2 × 5 = 10 Weightage)

Part C (Problems)

Answer any *four* questions. Each question carries 3 weightage.

13. Write an assembly language program for Intel 8085 to find the product of two one-byte numbers stored at memory address 2500 H and 2501 H. Store the two-byte product at 2600 H and 2601 H.

14. Sketch the timing diagram associated with the instruction MOV M, A.

15. Program Intel 8255 such that Port A and B are configured as mode 1 output ports and remaining pins of Port C as input.

16. Explain the use of the following AVR assembler directives.

    (a) ORG   (b) INCLUDE

17. Write an assembly language program for AVR microcontroller to swap the contents of two locations in the data memory.

18. Write a simple time delay routine for AVR microcontroller. Explain how the delay is calculated.

19. Write an AVR C program illustrating one-byte subtraction.

(4 × 3 = 12 Weightage)

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