

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2025
(Regular/Improvement/Supplementary)

PHYSICS
FPHY4E20 - MICROPROCESSORS, MICROCONTROLLERS AND
APPLICATIONS

Time: 3 Hours**Maximum Weightage: 30****Part A: Short answer questions. Answer *all* questions. Each carries *one* weightage.**

1. Explain how the microprocessor executes an instruction stored in memory.
2. Plot the timing diagram of Intel 8085 instruction MOV A, M.
3. Compare memory mapped and I/O mapped I/O schemes of address space partitioning.
4. Give a brief account of the operational features of Intel 8259 chip.
5. Explain any technique used for analog to digital conversion.
6. What is meant by the term embedded system? Give a brief account of any one application.
7. Discuss the status register of AVR microcontroller.
8. Give a brief account of the C language data types supported by AVR microcontroller.

(8 × 1 = 8 weightage)

Part B: Essay questions. Answer any *two* questions. Each carries *five* weightage.

9. Discuss in detail the internal architecture of Intel 8085 with the help of a functional block diagram.
10. Draw the internal functional block diagram of Intel 8257 and explain its working.
11. With the help of a labelled functional block diagram, discuss the operational features of a typical AVR microcontroller.
12. Discuss in detail the various functional features associated with I/O ports in AVR microcontroller.

(2 × 5 = 10 weightage)

Part C: Problems. Answer any *four* questions. Each carries *three* weightage.

13. Three different one-byte numbers are stored in continuous memory locations starting from 2000 H. Write an assembly language program for Intel 8085 to find the number with the intermediate value. Store the result in the next memory location.
14. Construct the flow chart for finding the product of two one-byte numbers using Intel 8085. Explain the flow of logic and data.

(P.T.O.)

15. Write down the machine cycles associated with the following five Intel 8085 instructions.
1. SUB M 2. DCX H 3. LXI B, 2000 H 4. IN 01 5. HLT
16. Find the minimum input voltage required for setting the least significant bit and that for setting all bits of an eight-bit ADC referenced at 5V.
17. Write an assembly language program for AVR microcontroller to double a one-byte number.
18. Write an assembly language program for AVR microcontroller to switch ON three LEDs one by one.
19. Write a C language program for AVR microcontroller to generate a time delay of 100 milliseconds. Assume 10 MHz clock frequency.

(4 × 3 = 12 weightage)