D4APH2203 **(2 Pages)** **Name.....**
Reg.No.....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2024
(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. Discuss the status flag register of Intel 8085.
2. Write down one AL instruction each for Intel 8085 using the addressing modes; Direct, Register indirect, Immediate and Implicit.
3. Explain the use of following Intel 8085 AL instructions.

   i) LXI SP <mem.add> ii) DAD D

   iii) JP <mem.add> iv) STAX B

4. Sketch a gated circuit to generate the control signals required for memory and I/O device interfacing in Intel 8085 and explain the operation.
5. Explain how the different modes of operation are set in Intel 8253.
6. What are embedded systems? Bring out the idea with suitable example.
7. Explain two branch instructions used in AVR Mega 32 microcontroller.
8. List the functions associated with Port B of AVR microcontroller.

(8 × 1 = 8 weightage)

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

9. Discuss in detail Intel 8259 interface chip.
10. With the help of a functional block diagram discuss the internal architecture of a typical AVR microcontroller.
11. Discuss any technique employed to implement ADC. With the help of a block diagram explain how an ADC chip is interfaced with microprocessor.
12. Explain in detail the features and programming of AVR I/O ports.

(2 × 5 = 10 weightage)

(P.T.O.)

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

13. Write an ALP for Intel 8085 to subtract a two-byte number from another stored in RAM. Store bit 1 in any general-purpose register if the result is negative, otherwise store bit 0.

14. Plot the Instruction cycle for Intel 8085 instruction MOV A, M.

15. Show how a seven-segment display can be interfaced with Intel 8085 to display a single decimal digit and explain the operation.

16. Write an ALP for AVR microcontroller to implement a time delay loop.

17. Show the status of C, Z and H flags in AVR microcontroller after executing the following codes.

    ```
    LDI R16, 0XAB
    LDI R20, 0XBA
    ADD R16, R20
    ```

18. Give a brief account of the unconditional jump instructions in AVR microcontroller.

19. Write AVR C program to check the status of bit 0 of Port C. If it is high, drive all Port B pins high, otherwise low.

(4 × 3 = 12 weightage)