D 143243 **(Pages : 2)** **Name.....**

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2026

(CBCSS)

Physics

PHY 4E 23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A

8 *Short questions, each answerable within* 7½ *minutes.*
Answer **all** *questions.*
Each question carries weightage 1.

1. What is the difference between a microprocessor and a CPU ?
2. Explain Fetch operation.
3. What is DMA data transfer scheme ?
4. What are the different applications of 8253 ?
5. Briefly explain call delay loop.
6. Explain the most critical needs of an embedded system.
7. Name three features of the AVR.
8. Give the magnitudes of the unsigned char and signed char data types.

(8 × 1 = 8 weightage)

Section B

4 *Essay questions, each answerable within* 30 *minutes.*
Answer any **two** *questions.*
Each question carries weightage 5.

9. Write an assembly language program to add two 8-bit numbers, the sum may be 16 bits. Classify 8085 instructions in various groups.
10. Draw and explain the timing diagram for memory read and memory write operations.

Turn over

11. Discuss various operating modes of 8253.

12. With a neat block diagram explain the general-purpose registers in the AVR.

(2 × 5 = 10 weightage)

Section C

7 *Problems answerable within* 15 *minutes.*

Answer any **four** *questions.*

Each question carries weightage 3.

13. Write an assembly language program for the addition of two-8 bit numbers 98 H and 9A H.

14. Write an assembly language programme to divide 489B by 1A.

15. Write an AVR C program to toggle all the bits of Port B 200 times.

16. Write an AVR C program to send hex values for ASCII characters of 0, 1, 2, 3, 4, 5, A, B, C, and D to port B.

17. Write an assembly language programme for the following operation : F8H-9BH.

18. What is the largest hex value that can be moved into an 8-bit register ? What is the decimal equivalent of that hex value.

19. Show the status of the C, H, and Z flags after the addition of 0x88 and 0x93 in the following instructions :

```
LD1   R20,   0X88
LD1   R21,   0X93
ADD   R20,   R21        ; ADD R21 TO R20
```

(4 × 3 = 12 weightage)