D 121323 **(Pages : 2)** **Name.....**

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2025

(CBCSS)

Physics

PHY4E23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A

8 *Short questions, each answerable within* 7.5 *minutes.*
Answer **all** *questions.*
Each question carries weightage 1.

1. Differentiate between Small Scale Integration (SSI) and Medium Scale Integration (MSI).
2. What is a Microprocessor ?
3. What is interrupt ?
4. What are the different applications of 8253 ?
5. What is an address space ?
6. In the ATmega32, how many pins are designated as I/O port pins ?
7. An embedded system is also called a dedicated system. Why ?
8. Explain AVR microcontroller I/O points.

(8 × 1 = 8 weightage)

Section B

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

9. Discuss various types of addressing modes of Intel 8085 instructions ? Give examples for each type of data format.

Turn over

10. Explain memory and I/O interfacing with schematic diagrams.

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

12. Explain I/O ports forms and functions. Discuss the features of ports A, B, C, and D. Explain the dual role of ports.

(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 programme to divide 54H by 09.

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

15. Write instructions to load value 0 × 95 into the SPL I/O register.

16. Show the status of the C, H, and Z flags after the addition of 0 × 38 and 0 × 2F in the following instructions :

```
LD1   R16,   0 × 38
LD1   R17,   0 × 2F
ADD   R16,   R17          ; ADD 17 TO R16
```

17. Find the sum of the values 0 × 79. 0 × F5, and 0 × E2. Put the sum into R20 (low byte) and R21 (high byte).

18. Write a test program for the AVR chip to toggle all the bits of PORTB, PORTC, and PORTD every ¼ of a second. Assume a crystal frequency of 1 MHz.

19. 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.

(4 × 3 = 12 weightage)