C 42063 (Pages : 2) Name......................................

Reg. No................................

FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2023

(CBCSS)

Physics

PHY 4E 23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

Section A

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

1. Briefly describe Port C of the AVR and explain some of its functions.

2. Distinguish between the variables- long and long long used for AVR programming.

3. Explain the purpose of EEPROM.

4. Explain the concept of formation of a control word.

5. Briefly explain the different memory interface schemes.

6. What are the important features of the Shift instruction in microprocessor ?

7. Briefly explain how an ADC works.

8. Enlist and explain any three control signals of 8085 microprocessor.

$(8 \times 1 = 8$ weightage)

Section B

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

9. With suitable examples explain the addressing modes of 8085 microprocessor.

10. With a neat schematic explain the architecture of the 8085 microprocessor.

11. Explain the data transfer schemes of 8085 based on DMA.

12. Explain features of the I/O ports of AVR.

$(2 \times 5 = 10$ weightage)

Turn over

Section C

7 problems answerable within 15 *minutes.*
Answer any **four** *questions, each carries weightage* 3.

13. What does the below code implement in AVR ?

    ```
    {
    ADCO_CTRLA &= ~ADC_ENABLE_bm;
    }
    ```

14. Write the AVR code line for "PORTB set to tri-state inputs"

15. Write a programme to multiply two 8 bit numbers stored at address 2050 and 2051 and store the result at the address 3050 and 3051.

16. Write an assembly level programme to find the largest number among numbers in an array starting at address 5000 and store it at the address 6000.

17. What logic operation is implemented with the below program in AVR ?

    ```
    int main()
    {
    DDRB = Oxff;
    PORTB = 0x00;
    while (1)
    {
    delay–ms(500);
    tbi(PORTB, PB0);
    }
    return 0;
    }
    ```

18. Find 2's compliment with carry of an 8 bit number stored at address 2050. Result is to be stored at address 3050 and 3051. Starting address of program is taken as 2000.

19. Write a programme to multiply two 8 bit numbers stored at address 2050 and 2051 and store the result at the address 3050 and 3051.

$(4 \times 3 = 12$ weightage)