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BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

DECE - FIFTH SEMESTER EXAMINATION

MICROCONTROLLERS

Time : 3 hours]   [*Total Marks* : 80

PART—A   3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. List any six features of microcontrollers.

2. List the interrupts of 8051 microcontrollers along with their vector address.

3. List the different addressing modes of 8051.

4. Define opcode and operand with examples.

5. What is the value of A register after executing the following program?

   MOV A, #78H

   ANL A, #0FH

6. Explain about RET and RETI instructions.

7. What is key bouncing problem? List different de-bouncing techniques.

8. Draw an interfacing diagram of a 4×4 matrix key board to 8051 microcontroller.

9. What is the need for MAX 232?

10. Explain the need of opto-couplers in interfacing.

PART—B

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Draw the functional block diagram of 8051 microcontroller and explain the function of each block. 10

12. Explain the following instructions : 10

(a) MUL AB

(b) DIV AB

(c) PUSH direct

(d) POP direct

(e) DA A

13. *(a)* Explain differences between MOV and MOVX instructions. 5

(b) Describe LJMP, AJMP, SJMP instructions. 5

14. Write a program to add two 16-bit numbers 1234H and 6789H. Store the sum in RAM location 8000H and 8001H and carry in 8002H. 10

15. Define subroutine and explain the sequence of program when subroutine is called and executed. 10

16. *(a)* Explain the function of each PIN in 16X2 LCD.   5

(b) Draw the interfacing diagram of 16X2 LCD module with 8051.   5

17. Write a program to generate a square wave of 1 kHz from the pin P3.1 of 8051, using Timer 1, Mode 1. Assume clock frequency of 12MHz.   10

18. *(a)* Explain briefly the working of stepper motor.   5

(b) Draw and explain a driver circuit required to run a stepper motor.   5

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