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BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

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. Compare microprocessors and microcontrollers.
2. State the function of TCON register of 8051 microcontroller.
3. Define fetch cycle and execute cycle.
4. Classify the instruction set of 8051 on the basis of number of bytes.
- \* 5. List various symbols used in drawing flowcharts.
6. Write briefly about PUSH and POP instructions of 8051.
7. List the reasons for the popularity of LCDs.
8. List the solutions for key-bouncing problem.
9. Write a short note on RS 232 standards.
10. State the need of optocoupler for interfacing.

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## PART—B

10×5=50

- 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 pin diagram of 8051 microcontroller and specify the purpose of each pin. 10
- 12.** Explain the following instructions with examples : 2×5=10  
(a) MOVX A, @Ri  
(b) XCH A, direct  
(c) ADDC A, direct  
(d) XRL A, #data  
(e) SWAP A
- 13.** Explain the addressing modes of 8051 with examples. 10
- 14.** Write a program to find the sum of given N numbers (series of numbers). The length of the series is in memory location 2100 H and the series itself begins from memory location 2101 H. Assume the sum to be 8-bit number and store the sum at memory location 2150 H. 10
- 15.** (a) Explain the sequence of program when subroutine is called and executed. 5  
(b) Explain the principles of single step and break point debugging techniques. 5
- 16.** Draw and explain the interfacing of a 4 × 4 matrix keyboard with 8051. 10
- 17.** Write a program using timer 0 and mode 1 to generate a square wave of frequency 2 KHz on P1.4. Assume clock frequency as 12 MHz. 10
- 18.** Explain the speed control of a stepper motor using 8051. 10

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