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C16-EC-502

**6630**

**BOARD DIPLOMA EXAMINATION, (C-16)**

**JUNE/JULY—2022**

**DECE - FIFTH SEMESTER EXAMINATION**

**MICROCONTROLLERS**

*Time : 3 hours ]*

*[ Total Marks : 80*

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**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.

1. List the interrupts of 8051 microcontroller and give their priority.
2. Draw the memory map of internal RAM (128 bytes) and indicate various parts.
3. Classify the instruction set of 8051 on the basis of number of bytes the instruction takes with examples.
4. Define opcode and operand.
5. Write a program to find the 2's complement of an 8-bit number in internal data memory location 35 H and store the result in 36 H.
6. Define subroutine.
7. Describe software key-debouncing solution for key-bouncing problem.
8. List the reasons for popularity of LCDs.
9. State the need of Opto coupler for interfacing.
10. Draw a simple interfacing diagram of 8051 with relay to drive a lamp.

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## 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. (a) Draw the functional block diagram of 8051 microcontroller. 5  
(b) Explain the function of any five special function registers briefly. 5
12. Explain the following instructions with examples : 10  
(a) SUBB A, direct  
(b) RLC A  
(c) MOVC A, @A+DPTR  
(d) CJNE @Ri, data, offset  
(e) ANL C, bit
13. (a) Explain any three addressing modes of 8051 with examples. 6  
(b) Write the flags effected on the following instructions and illustrate with examples : 4  
(i) ADD A,#data  
(ii) SUBB A, # data (Assume C = 0)
14. Explain information exchange between the PC and stack pointer and identification of stack pointer register when subroutine called with examples. 10
15. Write a program to perform 8-bit subtraction of two 8-bit numbers stored in the memory locations 2400 H and 2401 H store the result in 2402 H. If the result is positive store 00 H in the location 2403 H or if the result is negative store 01 H in the location 2404 H. 10
16. Draw and explain the interfacing of push button switches and LEDs with 8051. 10

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- 17.** Write an assembly language program to receive a message serially and store it in memory. 10
- 18.** (a) Explain the purpose of Max 232 for serial port communication with 8051. 5
- (b) Write an assembly language program to run stepper motor continuously. 5

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