



C09-EE-405

**3477**

**BOARD DIPLOMA EXAMINATION, (C-09)  
MARCH/APRIL—2017  
DEEE—FOURTH SEMESTER EXAMINATION**

DIGITAL ELECTRONICS AND 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. State De Morgan's theorem.
2. Convert  $A9FC.43_{16}$  into octal number system.
3. Draw the circuit of NAND latch and write its truth table.
4. Distinguish between RAM and ROM.
5. List the interrupts of 8051 microcontroller.
6. What is the difference between a counter and a timer?
7. Define fetch cycle and execution cycle.

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8. List different <sup>\*</sup> addressing modes of 8051.
9. List the rotate instructions of 8051 microcontroller.
10. Draw a flowchart to add two numbers stored in the iRAM locations 60H and 61H and to store the result in the register R6.

**PART—B**

10×5=50

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

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

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

11. Show that two half-adders and an OR gate constitute a full-adder.
12. Draw the circuit diagram of 2 4 decoder and explain the working.
13. Draw the diagram and explain the working of 4-bit asynchronous counter.
14. Explain the operation of master-slave *J-K* flip-flop with a neat sketch.
15. Draw the pin diagram of 8051 microcontroller and specify the function of each pin.
16. Describe the internal memory organization of 8051 microcontroller.
17. Explain the following branch instructions :
  - (a) LJMP
  - (b) DJNZ
  - (c) CJNE
  - (d) JNB
  - (e) ACALL
18. Write an 8051 assembly language program along with comments to add two 8-bit numbers stored in the external memory locations 4500H and 4501H. Store the result at 4502H and 4503H.

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