



C09-EE-405

3477

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2016
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) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Find the 2's complement of the binary numbers (a) 1001001101 and (b) 1101101110.
2. State the need for tri-state buffer.
3. List different types of flip-flop.
4. Distinguish between flash ROM and NVRAM.
5. List any three special functional registers of 8051 and write their uses.
6. List the interrupts of 8051 microcontrollers.

- * 7. Define fetch cycle and execution cycle.
8. Define op code and operand with examples.
9. List different addressing modes of 8051.
10. Write a program to transfer the content of memory location 2400 H to iRAM location 40 H and register R₂.

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. (a) Draw the symbols and explain the operation of NAND, NOR and X-OR gates using truth table. 6
- (b) State and explain De Morgan's theorems. 4

12. Draw and explain the working of a 4-bit parallel adder with an example.

13. What is race-around condition? Explain the working of master-slave *J-K* flip-flop with the help of truth table.

14. Explain the working principle of a 4-bit decade counter with the help of truth table.

* 15. Draw the functional block diagram of 8051. Explain the function of each block.

16. Explain the internal and external memory organizations of 8051 microcontroller.

* **17.** Explain the following instructions :

(a) MOVX @DPTR,A

(b) MUL AB

(c) RL A

(d) SWAP A

(e) SETB C

18. Write an assembly language program along with comments to add two 8-bit numbers stored in external memory locations 2400 H and 2401 H. Store the result in the locations 2402 H and 2403 H.
