



C09-EE-405

**3477**

**BOARD DIPLOMA EXAMINATION, (C-09)  
OCT/NOV—2013  
DEEE—FOURTH SEMESTER EXAMINATION**

DIGITAL ELECTRONICS AND MICROCONTROLLERS

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

**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 the need for a tristate buffer.
2. Draw the symbol and truth table of 2-input EX-OR gate.
3. List different types of ROMs.
4. What is a register? State the need for a register.
5. Explain the functions of RS0 and RS1 bits in PSW register.
6. Draw the block diagram of microcomputer.
7. Explain the difference between MOV and MOVX instructions.

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8. List different addressing modes of 8051.
9. Explain swap A instruction with one example.
10. Draw a flowchart to multiply two numbers 56H and 33H.

**PART—B**

**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) Convert  $1101111.11_2$  into octal and hexadecimal number systems.  
(b) Subtract  $1101.01_2$  from  $1001.11_2$  using 2's complement method.
12. (a) Draw the logic circuit and explain the function of half adder with its truth table.  
(b) Show that two half adders and an OR gate constitute a full adder.
13. Draw the circuit and explain the operation of *J-K* flip-flop with its truth table.
14. (a) Draw the diagram and explain the working of 4-bit asynchronous counter.  
(b) Draw the diagram of an asynchronous counter to count up to 10 clock pulses.
15. Explain various ports of 8051.

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- 16.** (a) Explain the SBUF register.  
(b) Draw and explain the bitwise description of PCON register.
- 17.** Explain the following branch instructions :
- (a) LJMP
  - (b) DJNZ
  - (c) CJNE
  - (d) JNB
  - (e) ACALL
- 18.** (a) Write an assembly language program to add two 8-bit numbers stored in the internal RAM locations 60H and 61H, and store the sum at 62H and 63H.  
(b) Write an assembly language program along with comments to add two 16-bit numbers 4536H and 5468H, and store the sum in R5 and R4. [R4 should have the lower byte]

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