



C09-EE-405

3477

**BOARD DIPLOMA EXAMINATION, (C-09)**  
**MARCH/APRIL—2014**  
**DEEE—FOURTH SEMESTER EXAMINATION**

DIGITAL ELECTRONICS AND 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 and shall not exceed *five* simple sentences.

1. Explain how a bubbled AND gate is equivalent to a NOR gate with symbols and truth tables.
2. What is a parity bit? Explain its importance.
3. Draw the circuit of dynamic memory cell.
4. Draw the logic circuit of 4-bit shift-right register.
5. List the alternate functions of port 3 of 8051 microcontroller.
6. List the timers of the 8051 and their associated registers.
7. List different addressing modes of 8051.

- \* 8. Define opcode and operand with one example each.
- 9. Explain SWAP A instruction with one example.
- 10. Write an assembly language program to multiply two 8-bit numbers stored in the iRAM locations 40 H and 41 H. Store the result in 42 H and 43 H.

**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 block diagram of serial adder and explain its working with an example.  
(b) Compare between the performance of serial adder and parallel adder.
- 12. (a) Write about BCD code.  
(b) Convert  $A9FC.43_{16}$  into octal number system.  
(c) Divide  $1111_2$  by  $11_2$ .
- 13. (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.
- 14. (a) Explain the operation of clocked R-S flip-flop with its truth table.  
(b) Draw the circuit and explain the operation of T-flip-flop with its truth table.

- \* **15.** Explain the internal organization of internal RAM of 8051 microcontroller.
- 16.** (a) List the SFRs associated with the following functions :
- (i) Interrupts
  - (ii) I/O ports
  - (iii) Serial communication
  - (iv) Power modes saving
- (b) List the interrupts as per their priority and vectored addresses.
- 17.** Explain the following branch instructions :
- (a) LJMP
  - (b) DJNZ
  - (c) CJNE
  - (d) JNB
  - (e) ACALL
- 18.** Write an assembly language program along with the comments to find the sum of first 8 natural numbers. Save the result at R5 and R6.

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