



C09-EE-405

3477

**BOARD DIPLOMA EXAMINATION, (C-09)**  
**OCT/NOV—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. What is analog signal? State the need for D/A converter.
2. Draw the block diagram of full adder using two half adders and an OR gate. Write the Boolean expressions for sum and carry.
3. What is counter? Define modulus of a counter.
4. What is shift register? List the different types of shift register.
5. What is the difference between a counter and a timer?
6. What are the functions of the following 8051 pins?
  - (a) ALE
  - (b)  $\overline{EA}$
  - (c)  $\overline{PSEN}$

- \* 7. Define fetch cycle and execute cycle.
- 8. List all types of rotate instruction of 8051.
- 9. List any six conditional jump instructions of 8051 microcontroller.
- 10. Draw a flowchart to multiply two numbers 56 H and 33 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 symbols and explain the operations of the following with their truth tables :
  - (i) AND gate
  - (ii) NOR gate
  - (iii) NOT gate
 (b) State and explain De Morgan's theorems.
- 12. (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.
- 13. (a) Distinguish between ROM and RAM.  
 (b) Draw the circuit and explain the working of dynamic memory.
- \* 14. Draw the circuit and explain the operation of master slave J-K flip-flop.
- 15. Explain the internal organization of internal RAM of 8051 micro-controller.
- 16. Draw and explain the bitwise description of IE and IP registers.

- \* **17.** Explain different addressing modes of 8051 and give two examples of each.
- 18.** (a) Write an assembly language program to add two 8-bit numbers stored in the internal RAM locations 60 H and 61 H and store the sum at 62 H and 63 H.
- (b) Write an assembly language program along with comments to add two 16-bit numbers 4536 H and 5468 H and store the sum in R5 and R4. (R4 should have the lower byte).

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