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C09–EE–405

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BOARD DIPLOMA EXAMINATION, (C–09)

APRIL/MAY—2015

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. Explain how a bubbled OR gate is equivalent to a NAND gate with symbols and truth tables.

2. Compare the performance of parallel adder and serial adder.

3. What are the differences between asynchronous and synchronous counters?

4. Distinguish between asynchronous and synchronous inputs of flip-flops.

5. State the functions of the following :

(a) Data pointer

(b) Program counter

6. List the timers of the 8051 and their associated registers.

7. Explain the MUL AB instruction with one example.

8. Define machine cycle and instruction cycle.

9. Explain SETB C, CPL C and NOP instructions.

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. Perform the following binary operations : 2+4+4

(a) Add $1101\ 11_2$ and $1110\ 01_2$

(b) Multiply $1110\ 11_2$ and $101\ 1_2$

(c) Subtract 1101_2 from 1110_2 using 2's complement method.

12. *(a)* Draw the logic circuit and explain the operation of 4 2 encoder. 5

(b) State the need for A/D and D/A converters. 5

13. *(a)* Briefly explain the data movement in the following registers with block diagrams : 5

(i) PISO

(ii) SIPO

(b) Explain the operation of 4-bit shift right register with diagram. 5

14. *(a)* Distinguish between ROM and RAM. 5

(b) Draw the circuit and explain the working of dynamic memory. 5

15. Explain the various ports of 8051.

16. *(a)* Draw and explain the bitwise description of PSW register. 5

(b) List the interrupts as per their priority and vectored addresses. 5

17. *(a)* Explain the following instructions : 5

(i) MOVX A, @ DPTR

(ii) PUSH

(b) Explain immediate and register indirect addressing modes with one example. 5

18. 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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