* 3 4 7 7 *

C09–EE–405

3477

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—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) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Draw the logic circuit and explain the function of half adder.

2. What is an analog signal? State the need for D/A converter.

3. State the need for preset and clear inputs.

4. Draw the logic circuit of a 4-bit shift-right register.

5. What are the functions of the following 8051 pins?

(a) ALE

(b) $\overline{EA}$

(c) $\overline{PSEN}$

6. State the functions of the following :

(a) Data pointer

(b) Program counter

7. Find the number of bytes for each of the following instructions take :

(a) MOV A, B

(b) MOVX @DPTR, A

(c) INC 40H

(d) ADDC A, #30H

(e) LJMP 16-bit addr

(f) CPL C

8. Explain DA A instruction.

9. Explain LJMP addr instruction.

10. Write a program to transfer the content of memory location 4500H to the iRAM location 40H, registers R2 and R3.

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 conversions : 4+4+2

(a) 125_{10} into binary and octal number systems

(b) AC6 $F3_{16}$ into binary and decimal number system

(c) 1010111_2 into BCD

12. Draw the symbols and explain the operation of the following with their truth tables : 2+4+4

(a) NOT gate

(b) NAND gate

(c) OR gate

13. *(a)* Distinguish between ROM and RAM.

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

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. Draw and explain the bitwise description of TMOD and TCON registers.

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

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

17. *(a)* Explain register addressing and register indirect addressing modes with one example of each.

(b) Explain PUSH and POP instructions.

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

★ ★ ★