



C09-EE-405

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**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.
