# 3477

**BOARD DIPLOMA EXAMINATION, (C–09)**

**MARCH/APRIL—2018**

**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. State the De Morgan's theorems.

2. State the need for A/D converters.

3. Classify the different types of memories.

4. Draw the 4-bit shift left register.

5. List the SFRs associated with timer/counter function in 8051.

6. List the features of 8051 microcontroller.

7. Define the terms 'opcode' and 'operand' of an instruction.

8. Explain SWAP A instruction with one example.

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**9.** Define fetch cycle and execution cycle.

**10.** Write an assembly language program to multiply two 8-bit numbers stored in the iRAM locations 40H and 41H. Store the result in 42H and 43H.

## 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.** Draw the circuit and explain the working of 4-bit parallel adder using full adders.

**12.** *(a)* Convert $A9FC.43_{16}$ into octal number system.       5

*(b)* Draw the circuit diagram of 2 × 4 decoder.       5

**13.** With a neat sketch, explain the working of edge triggered *J-K* flip-flop.

**14.** Draw the diagram and explain the working of 4-bit asynchronous counter.

**15.** Draw the pin diagram of 8051 microcontroller and specify the function of each pin.

**16.** Explain the internal memory organization of 8051 microcontroller.

**17.** Explain the addressing modes of 8051 microcontroller.

**18.** Write an 8051 assembly language program along with the comments to find the sum of first 8 natural numbers and save the result at R5 and R6.

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