DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

DIGITAL ELECTRONICS AND MICROPROCESSORS

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I   Answer *all* questions in one or two sentences. Each question carries 2 marks.

1.   List the four types of number system used in digital system.

2.   State the De Morgan's theorems.

3.   Define the term 'modulus of a counter'.

4.   Draw the symbol of clocked R-S flip flop and its truth table.

5.   List the registers contained in the special purpose register in a 8085 microprocessor.   (5×2 = 10)

PART — B

(Maximum marks : 30)

II   Answer any *five* of the following questions. Each question carries 6 marks.

1.   Explain the steps to convert a decimal number $(527.74)_{10}$ into binary and hexadecimal number.

2.   Draw the logic circuit for the expression $Y = B + \bar{B}C + AB$ using NAND gate.

3.   List the applications of flip flops.

4.   Explain the different modes of operations in shift register.

5.   Differentiate between synchronous and asynchronous counters.

6.   Explain the different addressing modes of 8085.

7.   Compare the TTL and CMOS gates.   (5×6 = 30)

Marks

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) Derive the EX-OR gate from basic gates and draw its symbol and truth table. 6

(b) Illustrate the procedure to add the following numbers in binary and verify the result $(AF1.B3)_{16} + (FFF.E)_{16}$. 9

OR

IV (a) Explain the steps for adding the decimal numbers $(-118)_{10}$ and $(-32)_{10}$ using eight bit 2's compliment arithmetic method. 6

(b) Explain the operations of common logic gates in digital circuits. 9

UNIT — II

V (a) Explain the logic diagram of 4×1 multiplexer with an ENABLE input. 6

(b) Explain the operation of master slave flip flop constructed with J-K flip flop. 9

OR

VI (a) Explain the working of octal-to-binary encoder. 6

(b) Explain the operation of R-S flip flop and draw the implementation of its active - LOW input and active - HIGH input using NAND gates. 9

UNIT — III

VII (a) Explain the operation of four bit UP/DOWN counter. 6

(b) Explain the modes of operation of a D/A converter. 9

OR

VIII (a) Explain the operation of a four bit synchronous counter with suitable wave form. 6

(b) Explain the major performance specifications of an A/D converter. 9

UNIT — IV

IX (a) Explain the instruction sets of 8051 microprocessor. 6

(b) With neat sketch explain the functional block diagram of 8085 microprocessor. 9

OR

X (a) Draw the schematic pin diagram of 8085 microprocessor. 6

(b) Explain the features of 8085 microprocessor. 9