# DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

## 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.   Draw the symbol of EX-OR gate and write output expression.

2.   State Demorgan's theorems.

3.   Name the different types of shift registers .

4.   Name any two status flags used in 8085 Microprocessor.

5.   State any two type of analog to digital converter.                        (5×2 = 10)


PART — B

(Maximum marks : 30)

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

1.   Convert the following Hexadecimal numbers into binary and then to decimal

     (a)   $4BC_H$                    (b)   $F24_H$

2.   Diagrammatically represent the following gates using NAND gate.

     (a)   AND                    (b)   OR

3.   Draw the logic diagram and truth table of an active high clocked RS flip flop.

4.   Draw the logic diagram and truth table of a serial-in parallel out shift register to store and retrieve a data $1011_2$ using positive edge triggered D-flip flops.

5.   List the characteristics of ECL logic family.

6.   Draw a 2-bit synchronous up counter with truth table.

7.   State any six highlighting features of 8085 Microprocessor.                        (5×6 = 30)

## PART — C

(Maximum marks : 60)

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

### UNIT — I

III  (a)  Convert +14 and +24 into binary equivalent and subtract +14 from + 24 using 2's complement method. Show all conversion steps.    8

     (b)  Draw a two input AND gate using diodes and resistor and explain it.    7

OR

IV  (a)  Convert the following decimal numbers to binary and hexadecimal number systems.

       (i)  $25.25_D$      (ii)  $61.625_D$   Show all conversion steps.    8

     (b)  Explain the following characteristics of digital ICs.

       (i) Propagation delay      (ii) Fan-in      (iii) Fan out    7

### UNIT — II

V  Design and Draw the logic diagram for a full Adder using k-map.    15

OR

VI  (a)  Draw the logic diagram and truth table to explain a 1 line to 4 line de-multiplexer.    9

     (b)  Define a decoder. Draw and explain a basic binary decoder to detect $1001_2$.    6

### UNIT — III

VII  Explain a 4-bit (MOD-16) asynchronous up counter with the help of a logic diagram, timing diagram and a table showing counting sequence.    15

OR

VIII  Describe binary weighted type digital to analog converter with relevant diagrams. Prove the output voltage is proportional to the binary weights of resistors.    15

### UNIT — IV

IX  (a)  Draw pin diagram of 8085 microprocessor and mark pin functions.    9

     (b)  Explain the Flag register with reference to 8085 microprocessor.    6

OR

X  (a)  Explain the following control and status signals in 8085 microprocessor.

       (i) S0, S1      (ii) IO/$\overline{M}$      (iii) $\overline{RD}$ and $\overline{WR}$    9

     (b)  List the following instruction types in 8085 microprocessor with examples.

       (i) Data Transfer Instructions  (ii) Arithmetic Instructions  (iii) Logical Instructions.    6