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N19-02201

TED (15) -3133

Reg. No. ....

(REVISION — 2015)

Signature .....

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

DIGITAL COMPUTER PRINCIPLES

[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. Define 2's complement of a number with example.
2. What is weighted binary code ? Give an example.
3. Define combinational logic.
4. List the asynchronous inputs of a flipflop.
5. Name any one error detection and correction code.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Design two input AND and two input OR Operations using NAND gate.
2. State and prove Demorgan's laws.
3. Reduce the expression  $F = A + AB + ABC + ABCD$
4. Design and explain the circuit of a Half adder.
5. Draw and explain the circuit of a Clocked D Flip-flop
6. Draw the circuit of a 3 bit binary Up counter using JK Flip-Flop.
7. Define the terms Resolution and Accuracy of a DAC

(5×6 = 30)

[P.T.O.]

## PART — C

(Maximum marks : 60)

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

## UNIT — I

- III (a) Convert the following
- (i)  $ABCD_{16}$  to OCTAL      (ii)  $1000_{10}$  to Binary      9
- (iii)  $476_8$  to Decimal      6
- (b) Draw the logic diagram and truth table of two input NOR gate and EXOR gate.      6

OR

- IV (a) Explain different Boolean laws and theorems.      9
- (b) Draw the logic diagrams and truth tables of basic gates.      6

## UNIT — II

- V (a) Simplify using Kmap and draw the logic circuit for  
 $F_{(ABCD)} = \sum (0,1,2,3,6,7,8,9)$       9
- (b) Define Minterms and Maxterms.      6

OR

- VI (a) Draw and explain the circuit of a 4 bit binary adder.      9
- (b) Draw the circuit and truth table of 4 to 1 Multiplexer.      6

## UNIT — III

- VII (a) Explain the basic operations of different shift registers with neat sketch.      9
- (b) Draw the circuit of a 4 bit ring counter.      6

OR

- VIII (a) Draw and explain the operations of Master Slave JK with truth table.      9
- (b) Compare synchronous and asynchronous counter.      6

## UNIT — IV

- IX (a) Explain the working of a R-2R ladder type ADC with neat sketch.      9
- (b) Define monotonicity and offset voltage.      6

OR

- X (a) Explain the working of Counter type ADC with neat sketch.      9
- (b) Explain the operation of reading and writing a memory cell.      6