TED (15) -3133
(REVISION - 2015)

Reg. No
Signature $\qquad$

## 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.

## 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 $\mathrm{F}=\mathrm{A}+\mathrm{AB}+\mathrm{ABC}+\mathrm{ABCD}$
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 Lp counter using JK Flip-Flop:
7. Define the terms Resolution and Accuracy of a DAC
PART - C
(Maximum marks : 60)
(Answer one full question from each unit. Each full question carries 15 marks.)
Unit - I

III (a) Covert the following
(i) $\mathrm{ABCD}_{16}$ to OCTAL
(ii) $1000_{10}$ to Binary
(iii) $476_{8}$ to Decimal
(b) Draw the logic diagram and truth table of two input NOR gate and EXOR gate.

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

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

## OR

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

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

## OR

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

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

## OR

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

