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TED (15) -3133
(REVISION — 2015)

Reg. No.
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
- (iii) 476_8 to Decimal 9
- (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 9
 $F_{(ABCD)} = \sum (0,1,2,3,6,7,8,9)$
- (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