

TED (10)–3066

(REVISION—2010)

Reg. No. ....

Signature .....

THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/  
TECHNOLOGY—OCTOBER, 2012

**DIGITAL COMPUTER PRINCIPLES**

(Common for CT, CM and IF)

[Time : 3 hours

(Maximum marks : 100)

PART—A

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Write one example each for weighted and unweighted number systems.
2. List any two applications of hamming codes.
3. Write the main advantage and disadvantage of CMOS logic families.
4. List any two applications of a multiplexer.
5. Name any two asynchronous inputs of a flip-flop.

(5×2=10)

PART—B

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

1. Draw the truth table and logic symbol for an EX\_OR and EX\_NOR gates.
2. Write the features of hexadecimal number system. How to convert it to decimal and binary ?
3. Simplify the Boolean equation  $Y = ABC + ABC + ABC + ABC$  using K-map.
4. Draw the truth table of a three bit binary to gray code converter.
5. Describe the operation of a single bit magnitude comparator with a suitable logic diagram.
6. State the two Demorgans theorems and prove using Boolean laws.
7. Draw the logic diagram and truth table for an SR flip-flop.

(5×6=30)

PART—C

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

UNIT—I

III A hamming code received by a receiver in even parity scheme is 1011011. Check if any error occurred, if so correct it.

15

OR

	Marks
IV (a) A61B convert to decimal and binary.	6
(b) 101101 convert to decimal and octal.	6
(c) Subtract 1010 from 1100.	3

## UNIT—II

V Simplify and implement the following Boolean function in SOP $F(A, B, C, D) = \sum m(0, 1, 6, 7, 8, 9, 14, 15)$	15
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OR

VI (a) With suitable circuit diagram explain the working of a TTL inverter.	10
(b) Compare CMOS and TTL logic families.	5

## UNIT—III

VII Design and implement a full subtractor.	15
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OR

VIII Design and implement a four bit binary to gray code converter.	15
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## UNIT—IV

IX With the help of a Logic diagram, Truth table and timing diagram explain the working of a JK flip flop.	15
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OR

X Design and implement a MOD-10 ripple counter using JK flip flop.	15
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