



DOON UNIVERSITY, DEHRADUN
Mid Semester Examination, First Semester, 2014
School of Technology

Integrated MCA
Course: STM-506 Digital Circuits and Systems

Time Allowed: 2Hours

Maximum Marks: 30

Note: Attempt All Sections A,B,C.

SECTION: A

Short Answer Type Questions/ to be answered in about 50 words. Attempt All Questions.

(Marks:10X1/2=5)

1. $(A6BF5)_{16} = ()_2$
2. $(A6F.CD)_{16} = ()_8$
3. $(1011101.1011)_2 = ()_{16}$
4. $Y=?$ If $Y=A'B'C' + AB$, under following conditions:
 $A=1, B=0, C=1$
5. What is even parity bit for the message 1011011011?
6. Parity bit check method can check only single bit error. Is this statement is true, explain.
7. Explain BCD addition.
8. Explain logical AND and OR operation.
9. Under what conditions will the output of an AND operation is 0.
10. State and prove distributive property of Boolean algebra.

SECTION: B (Short Answer Type Questions)

Attempt All Questions.

(Marks: 5X2=10)

1. What is a gray code? Why it is important? Write grade codes of numbers from 1 to 10.
2. Simplify following:
 - a. $AB'C'+A'B'C'+A'BC'+A'B'C$
 - b. $ABC+A'BC+A.B'C+ABC'+AB'C'+A'BC'+A'B'C'$
3. What is a truth table?
4. Explain don't care condition.
5. Differentiate between reflexive and sequential codes with appropriate example.

SECTION: C (Long Answer Type Questions)
Attempt all Questions

(Marks: 5X3=15)

1. What is a hamming code? A 7-bit hamming code is received as 0101101. What is its correct code?
2. State and prove DeMorgan's theorem for 4-variable function.
3. Using K-map method, simplify the following function, obtain their
 - (i) Minimum Sum of products, and
 - (ii) Minimum product of sums form.
$$F(w,x,y,z) = (1,3,4,5,6,7,9,12,13)$$
4. Using Boolean algebra, verify:
 - a. $(A+B)(B+C)(C+A)=AB+BC+CA$
 - b. $AB+(AC)'+AB'C(AB+C)=1$
5. Explain rules of binary subtraction using 2's complement with suitable examples.
