Name: KEY Id#

COE 202, Term 132

Digital Logic Design

Quiz# 3

Date: Sunday, March 16

# 

# **Q1.** For the following Boolean function F(A, B, C, D)=m(0, 1, 2, 5, 6, 7, 8, 9, 10, 12, 13)

AB

CD

00

01

11

10

00

01

11

10

1

1

0

1

0

1

1

1

1

1

0

0

1

1

0

1

# Identify all the *prime implicants* and the *essential prime implicants* of F.

**Prime Implicants**: C’D, B’C’, AC’, B’D’, A’BD, A’BC, A’CD’

**Essential Prime Implicants**: AC’, B’D’

# Simplify the Boolean function **F** into a minimal sum-of-products expression.

**F** =AC’ + B’D’ + C’D + A’BC

# **Q2.** Consider the following Boolean function **F** together with the don`t care conditions **d**

## F(A, B, C, D)=m(0, 2, 5, 8, 10), d(A, B, C, D)=m(3, 4, 7, 9, 11, 13, 14, 15)

AB

CD

00

01

11

10

00

01

11

10

1

0

X

1

X

1

X

0

0

X

X

X

1

X

X

1

# Simplify the Boolean function **F** together with the don`t care conditions **d,** into minimal product-of-sums expression.

**F’ =** B’D + BD’

**F =** (B + D’)(B’ + D)