Machakos University College

ISO 9001:2008 Certified

(A Constituent College of Kenyatta University)

SCHOOL OF ENGINEERING

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EED215 DIGITAL ELECTRONICS II

SUPPLEMENTARY EXAM DIP2

Q1a) Map the following sum of products (SOP) expression on the Karnaugh Map:

$\bar{A}\bar{B}C+\bar{A}BC+AB\bar{C}+ABC$ 7 Mks

b)Map the following standard Sum of products (SOP), expression on a Karnaugh Map

$\bar{A}\bar{B}CD+ABC\bar{D}+AA\bar{C}\bar{D}+\bar{A}\bar{B}\bar{C}\bar{D}+ AB\bar{C}D+\bar{A}\bar{B}\bar{C}D+A\bar{B}C\bar{D}+ABCD$ 8Mks

c) Simplify the following Boolean expression using the Karnaugh Mapping technique

$X = \bar{A}B+ \bar{A}\bar{B}C+AB\bar{C}+ABC$ 8Mks

d) Simplify the following SOP expression using the Karnaugh Mapping technique

$X = \bar{A}B\bar{C}D+A\bar{B}\bar{C}D+\bar{A}\bar{B}\bar{C}D+AB\bar{C}D+AB\bar{C}\bar{D}+ABCD$ 7Mks

Q2a) List five of the main logic families 5Mks

b) Name five basic operating characteristics and parameters of logic families 5Mks

c) Explain briefly each of the above operating characteristics 10Mks

Q3 a) i) Draw a DTL logic circuit and explain It's operation.

ii) What are four of it's characteristics. 10Mks

b) i) With the aid of an RTL family logic gate explain it's operation.

ii) Indicate five of it's characteristics. 5Mks

c) Draw a basic TTL gate and describe all it's operation characteristics. 5Mks

Q4 a) What are the seven major characteristics of C-MOS? 10Mks

b) Explain the operation of a P-MOS logic circuit 10Mks

Q5)a) Determine the Boolean expression for the logic circuit shown below 5Mks

b) Simplify the Boolean expression using the Boolean laws and De Morgan theorem 5Mks

c) Re- draw the logic circuit using the simplified Boolean expression. 10Mks