

QP CODE 2140554303

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DMI-ST. EUGENE UNIVERSITY

ZAMBIA

DEGREE EXAMINATION – DECEMBER 2023

Semester: IV 055CS43 FUNDAMENTALS OF DIGITAL ELECTRONICS

Time: 3:00 Hours

Max. Marks: 100

Answer any FIVE Questions (5 x 20 = 100 Marks)

1. a) Differentiate between the Octal Number and the Hexadecimal Number System. **(10 Marks)**
b) Explain the Signed Number System and Unsigned Number System. **(6 Marks)**
c) Give short notes about first complement and second complement. **(4 Marks)**
2. a) What is Logic Gates? Discuss their Application. **(10 Marks)**
b) What is Boolean algebra? Explain briefly about the law. **(10 Marks)**
3. a) Draw the Full Adder Circuit and explain it. **(10 Marks)**
b) Draw the Full Sub-tractor Circuit and explain it. **(10 Marks)**
4. a) What is Flip- flops? Discuss JK Master-Slave Flip flops in detail. **(10 Marks)**
b) Detail the Edge- triggered Flip flop. **(10 Marks)**
5. a) Discuss the Counter type method of Conversion? **(10 Marks)**
b) Discuss the Ramp type method of Conversion. **(10 Marks)**
6. a) State and Prove De-Morgan's First and Second Theorem. **(10 Marks)**
b) Prove the following expressions:
 - i. $XY + \bar{X} + YZ = \bar{X}Z + XY$
 - ii. $\bar{X} \bar{Y} Z + \bar{X} Y Z + X \bar{Y} = \bar{X} Z + X \bar{Y}$ **(10 Marks)**
7. a) Draw the 1×4 De Multiplexer Circuit and explain. **(10 Marks)**
b) Draw the 4×1 Multiplexer Circuit and explain it. **(10 Marks)**