

QP CODE 2040554304

Reg. No

--	--	--	--	--	--	--	--	--	--



DMI-ST. EUGENE UNIVERSITY

ZAMBIA

DEGREE EXAMINATION – DECEMBER 2024

Semester: IV 055 CS 43 FUNDAMENTALS OF DIGITAL ELECTRONICS

Time: 3:00 Hours

Max. Marks: 100

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

1. a) What weight does the digit 5 have in each of the following decimal number? (4 Marks)
 - i. 1530
 - ii. 1.059
 - iii. 3258
 - iv. 567.9
- b) Convert the following binary numbers to Decimal, Hexadecimal and Octal form: (6 Marks)
 - i. $(101101.1101)_2$
 - ii. $(11011011.100101)_2$
- c) Convert the following Hexadecimal to Decimal: (10 Marks)
 - i. FACE
 - ii. CAFE
 - iii. DEAF
 - iv. FADE
 - v. DICE
2. a) Draw the Logic symbol and construct the truth table for each of the following gates: (10 Marks)
 - i. Two input AND gate
 - ii. Two input OR gate
 - iii. Two input EX-OR gate

- iv. Two input EX-NOR gate
- v. Two input NAND gate

b) Prove the following expressions: **(10 Marks)**

i. $XY + \bar{X} + YZ = \bar{X}Z + XY$

ii. $\bar{X} \bar{Y} Z + \bar{X} Y Z + X \bar{Y} = \bar{X} Z + X \bar{Y}$

- 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 Successive Approximation method. **(10 Marks)**
- 6. a) State and Prove De-Morgan's First and Second Theorem. **(12 Marks)**
b) Write the 12 boolean laws. **(8 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)**