

PAN AFRICA CHRISTIAN UNIVERSITY
EXAMINATIONS PAPER



PAN AFRICA CHRISTIAN UNIVERSITY
BACHELORS OF INFORMATION COMMUNICATION TECHNOLOGY
END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY
COURSE CODE: BSIT 101
CAMPUS: ROYSAMBU
COURSE TITLE: DIGITAL ELECTRONICS
EXAM DATE: MONDAY
TIME: START HOUR – END 11:00-14:00 HRS

INSTRUCTIONS

- This exam carry a total of SIX Questions of [10 Marks Each]
- Section One (I) is compulsory.
- Answer any 3(Three) Questions from Section Two (II)
- Read all questions carefully before attempting.

Question One (10mks)

(Answer all question in this section)

- a) Define digital electronics and its importance in real world **(2 Marks)**
- b) State and explain any four types of digital logic circuits **(4 Marks)**
- c) Convert Binary Number 110011 to a Decimal Number **(2 Marks)**
- d) Define Boolean expression and state its importance in digital electronics **(2 Marks)**

SECTION B-Answer any 3 questions

Question one (10 Marks)

- a) Define Demorgan's theorems as used in digital electronics **(2 Marks)**
- b) Compute binary equivalent of the decimal number 368 **(2 Marks)**
- c) Translators are commonly used in digital electronics, name and explain any two translators **(2 Marks)**
- d) Define flip-flops as used in digital electronics **(2 Marks)**
- e) Describe the importance of truth table of logic gates **(2 Marks)**

Question Two (10 Marks)

- a) Base on the NAND gate diagram, build a 4 input truth table **(2 Marks)**



Exhibit 2.2: NAND

- b) Below is an XOR gate Table, represent the inputs in a logic XOR gate circuit **(2 Marks)**

A	B	$\oplus$
0	0	0
0	1	1
1	0	1
1	1	0

Table 4: XOR table

- c) With an aid of a diagram, differentiate between NAND gate and AND gate **(4 Marks)**
d) Flip-flops are commonly used in digital circuits, state two application **(2 Marks)**

Question Three (10 Marks)

- a) Describe digital circuit as used in digital electronics. **(1 Marks)**
b) List and explain the TWO types of digital circuits. **(2 Marks)**
c) Differentiate between combinational and sequential digital circuit. **(2 Marks)**
d) State and explain the types of sequential logic gates. **(2 Marks)**
e) Boolean algebra is commonly used in digital electronics, State the Laws & Rules. **(3 marks)**

Question Four (10 Marks)

- a) Describe two sequential circuits used in digital circuits. **(2 Marks)**
b) List the advantages of digital circuits. **(2 Marks)**
c) State the disadvantages of digital circuits. **(2 Marks)**
d) State and explain FOUR application areas of digital circuits. **(4 Marks)**

Question Five (10 marks)

- a) Explain with Symbolic representation how below logic gates works: **(4 Marks)**
i) AND
ii) OR
iii) NAND

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iv) NOR

b) Convert 8 decimal notation to signed binary number.

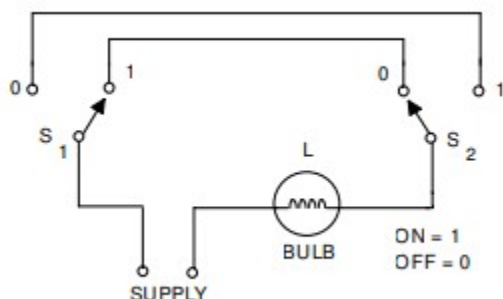
(2 Marks)

c) Differentiate between Multiplexers and Demultiplexers.

(2 Marks)

Question Six (10 Marks)

- a) A staircase light is controlled by two switches one at the top of the stairs and another at the bottom of stairs as shown below; **(6 Marks)**



- (i) Make a truth table for this system.
- (ii) Write the logic equation in SOP form.
- (iii) Realize the circuit using AND-OR gates.
- b) Describe the code where all successive numbers differ from their preceding number by single bit. **(2 Marks)**
- c) The output of a logic gate is 1 when all its inputs are at logic 0. State the combination gates that gives this nature of output. **(2 Marks)**