PAN AFRICA CHRISTIAN UNIVERSITY
EXAMINATIONS PAPER

PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: **COMPUTING AND INFORMATION TECHNOLOGY**

COURSE CODE: **BIT/BICT 101**

COURSE TITLE: **DIGITAL ELECTRONICS**

EXAM DATE: **DECEMBER, 2022**

TIME: **THURSDAY 5PM-8PM**

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B.**
- Write only your **student number** on the answer booklet provided.
- None programmable calculator permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

QUESTION ONE

a) Convert the following to decimal [**4 Marks]**
   i) $19FE_{16}$
   ii) $211AD_{16}$

b) Evaluate the AND gate or Inverter in computation logics [**3 Marks]**

c) You have a pen drive that is 1GB(Gigabyte) in size, determine how many mp3 files, each 2.5MB(Megabyte) can be stored in your pen drive (show your working)

[3 Marks]

SECTION B (Answer Any Three (3) Questions)

QUESTION TWO

a) Convert 4096 nibbles into bytes [**2 Marks]**

b) Using A and B as input demonstrate the output. **[4 Marks]**
   i) NOT gate
   ii) XOR gate

c) Differentiate between JK flip- flop and SR flip-flop [**2 Marks]**

d) State De-Morgan's theorems **[2 Marks]**

QUESTION THREE

a) State **THREE** advantages of digital systems over analogue systems

[3 Marks]

b) A 6-bit successive approximation ADC is used to convert an analogue signal.

Determine the:

i) Percentage resolution **[3 Marks]**
ii) Time to convert a half-scale analogue signal, if its clock frequency is 1 Hz

[4 Marks]

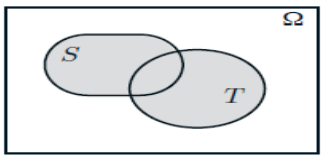
QUESTION FOUR

a) Draw a logic circuit for the logic expression (A+B)(C+D)C **[4 Marks]**

b) Use Boolean Algebra to simplify the expression AB(A+B)(B+B) **[3 Marks]**

c) If S, T and U are Sets and Ω is the universal set, Interpret each of the following Venn diagrams. **[3 Marks]**

i.



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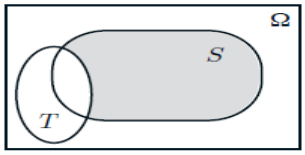

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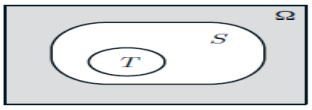

QUESTION FIVE

a) A microcomputer has 32K x 8 ROM memory. The available memory chips are 8K x 8 ROM.Determine the:

i) Word size **[2 Marks]**

ii) Address line for the entire systems **[2 Marks]**

iii) Number of chips required for the entire systems **[2 Marks]**

b) A security alarm system uses four sensors to monitor the four corners of a building. The alarm is triggered when at least sensors are activated. Draw the truth table for the system **[4 Marks]**

QUESTION SIX

a) State **TWO** disadvantages of the Asynchronous counter **[2 Marks]**

b) Differentiate

i) between 9's and 10's complement **[2 Marks]**

ii) Set-up time and hold time **[2 Marks]**

c) Convert 11010_2 into 2nd complement **[2 Marks]**

d) Explain briefly about PISO **[2 Marks]**

