PAN AFRICA CHRISTIAN UNIVERSITY

DIPLOMA INFORMATION COMMUNICATION TECHNOLOGY

END OF TERM EXAMINATION

DEPARTMENT: **COMPUTING & INFORMATION TECHNOLOGY**

COURSE CODE: **DICT0122**

CAMPUS: **ROYSAMBU**

COURSE TITLE: **COMPUTER ELECTRONICS**

EXAM DATE: **7th April 2025**

TIME: **2:00 PM**

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.

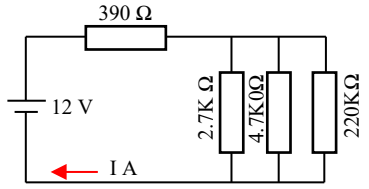
© Copyright 2025 All Rights Reserved PAC University

SECTION ONE: (COMPULSORY) 10 MARKS

QUESTION ONE

a. Explain the working principle of a N-P-N transistor. [3 Marks]

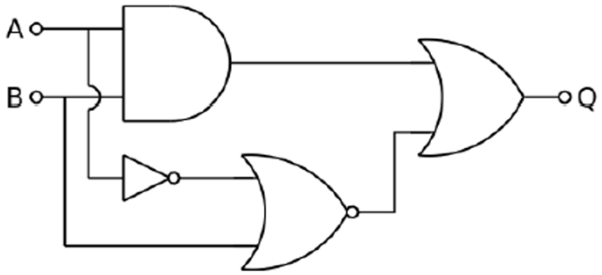
b. Given the circuit below, calculate the current flowing through the circuit. [2 Marks]



c. Convert the following numbers into their binary equivalent. [2 Marks]

i. 12_8 ii. 10_{16}

d. Using a Truth Table, explain how the following logic circuit works. [3 Marks]



SECTION TWO: (ANSWER ANY THREE (3) QUESTIONS) 30 MARKS

QUESTION TWO.

a. Distinguish between computer memory and computer storage. [2 Marks]

b. Discuss three characteristics of computer memory. [3 Marks]

c. Distinguish between Cache and Primary (Main) Memory. [2 Marks]

d. Discuss two types of Magnetic Disks and explain why Solid-State disk is preferred over magnetic disks. [3 Marks]

QUESTION THREE.

a. There are two main ways that resistors are used in electronics. Name and explain the two ways. [4 Marks]

b. Design a circuit with both series and parallel configurations. [4 Marks]

c. Discuss how transformers are used in electronic devices. [2 Marks]

QUESTION FOUR.

Given the Truth Table below.

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

a. Write the Boolean expression of the above table. [2 Marks]

b. Minimize the expression using the Boolean Algebraic Laws. [3 Marks]

c. Design a circuit using AND, OR, and NOT gates to implement the Boolean expression F(ABC)=A'B+AB'C. [5 Marks]

QUESTION FIVE.

a. Design a D flip-flop circuit and explain its operation. [3 Marks]

b. Use the above flip-flop to build a 2-bit binary counter. [5 Marks]

c. Discuss two advantages of using JK flip-flop in sequential circuits. [2 Marks]

QUESTION SIX.

a. Investigate how 5G technology can be used in the transportation industry. [3 Marks]

b. Discuss the role of electronics in addressing challenges related to the integration of renewable energy into existing power grids. [3 Marks]

c. Differentiate between "half-wave" and "full-wave rectifiers". [4 Marks]

-END-