

PAN AFRICA CHRISTIAN UNIVERSITY

DIPLOMA INFORMATION COMMUNICATION TECHNOLOGY

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: DICT0122

CAMPUS: ROYSAMBU

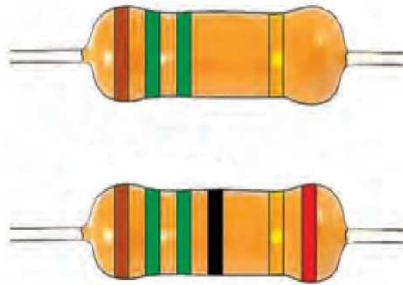
COURSE TITLE: COMPUTER ELECTRONICS

EXAM DATE: 4th August 2025

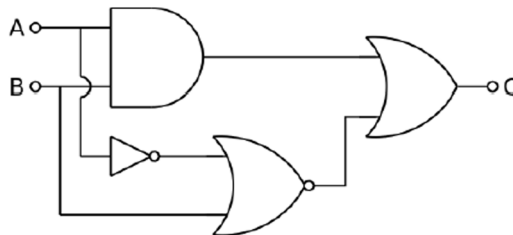
TIME: 2:00 PM

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.

QUESTION ONE

- a. (i) Explain the difference between the two resistors above. [2 Marks]
(ii) Determine the values of the two resistors in ohms (Ω) [2 Marks]
- b. Determine the sum of the following binary numbers. [2 Marks]
- i.
$$\begin{array}{r} 101101 \\ 110010 \\ \hline \end{array}$$
- ii.
$$\begin{array}{r} 11110101 \\ 0111110 \\ \hline \end{array}$$
- c. Using a Truth Table, explain how the following logic circuit works. [4 Marks]

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

- 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 THREE.

- 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 FOUR.

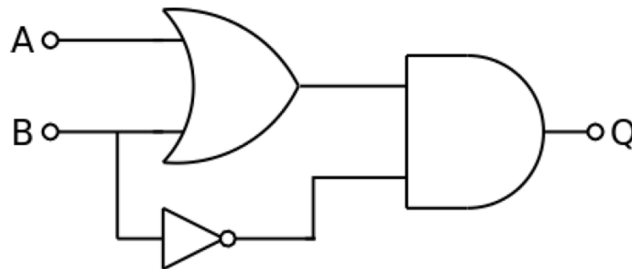
- a. Describe the construction of a diode. [2 Marks]
b. Explain the importance of rectification in Electronics [2 Marks]
c. With the aid of a diagram, describe the full-wave rectification process [6 Marks]

QUESTION FIVE.

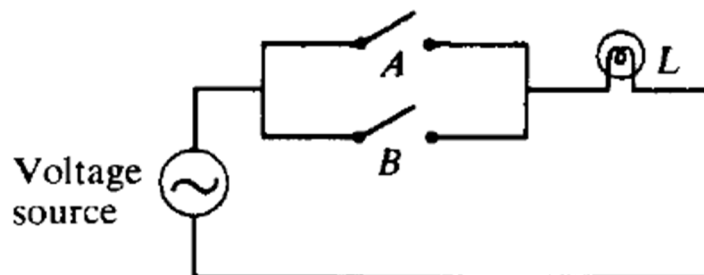
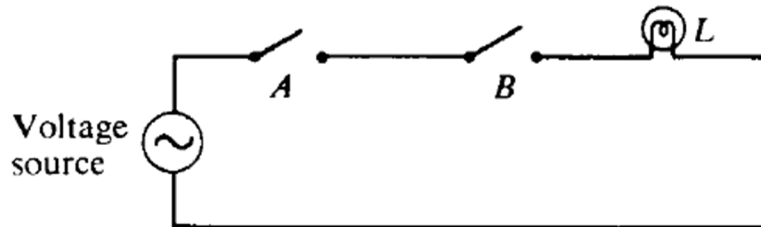
- Explain what a semiconductor material is. [1 Mark]
- Discuss the two basic types of semiconductor materials [2 Marks]
- Explain the difference between intrinsic and extrinsic semiconductors [4 Marks]
- With the aid of a simple block diagram, describe the operation of an Uninterruptible Power Supply (UPS) [3 Marks]

QUESTION SIX.

- Write down the Boolean Expression of the Logic Circuit below and simplify the expression to its simplest form [2 Mark]



- Determine the logic circuit represented by the diagrams below [2 Marks]



- Minimize the following expression by use of Boolean rules. [6 Marks]

- $X = A B C + A' B + A B C'$
- $X = A' B C' + A B C' + A' B C' + A' B C'$
- $X = A B C + A B C + A B C'$

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