061006T4ICT

ICT TECNICIAN LEVEL 6

IT/OS/ICT/CC/01

APPLY BASIC ELECTRONICS

NOV/DEC 2023

TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

WRITTEN ASSESSMENT

Time: 3 Hours

INSTRUCTIONS TO CANDIDATES

1. This paper has TWO sections A and B. Attempt questions in each section as per instructions given in the section.
2. You are provided with a separate answer booklet.
3. Marks for each question are indicated in the brackets.
4. Do not write on the question paper

This paper consists of 4 printed pages

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A: 40 MARKS

Answer ALL questions in this section.

1. List any FOUR electronic components and their functions. (2 Marks)
2. State TWO types of switches? (2 Marks)
3. Define the following terms as used in electronics (8 Marks)
   i. Electric current
   ii. Potential difference
   iii. Series circuit
   iv. Parallel circuit
4. Define the term nanoelectronics and state one way that it has affected the design and manufacturing of electronic devices. (4 Marks)
5. State ohm's law. (2 Marks)
6. If the resistance of an electric iron is 50 Ω and a current of 3.2A flows through the resistance. What is the voltage? (2 Marks)
7. Draw a labelled, schematic diagram of an electric circuit comprising of a cell, a resistor, an ammeter, a voltmeter and a closed switch (7 Marks)
8. Outline any FIVE advantages and FOUR disadvantages of semiconductor over other devices? (9 Marks)
9. Outline any TWO differences between intrinsic and extrinsic semiconductors. (4 Marks)

SECTION B: 60 MARKS

Answer any THREE questions in this section.

10.

a) Differentiate between the following as used in computers. (4 Marks)

i. Dynamic RAM (DRAM) and static RAM (SRAM).

ii. *Main Memory* and *cache* memory.

b) With the aid of a diagram outline the structure of magnetic disk. Showing the track sectors, disk sectors and tracks. (4 Marks)

c) Discuss any SIX challenges of emerging trends in electronic manufacturing. (12 Marks)

11.

a) Outline FOUR differences between N-type and P-type semiconductors (8 Marks)

b) Explain the following terms as used in Bipolar transistor configuration (6 Marks)

i. Common Base Configuration

ii. Common Emitter Configuration

iii. Common Collector Configuration

c) With aid of a sketch, outline the configurations mentioned in 5b above PN junction diode showing both the input signal and output. (6 Marks)

12.

a) List FOUR types of number systems used in computers together with their base. (4 Marks)

b) Convert the following number systems to their equivalent as indicated in each question

Binary to Decimal

i. 1011_2 (2 Marks)

ii. 10110_2 (2 Marks)

Octal to Decimal

i. 542_8 (2 Marks)

ii. 345_8 (2 Marks)

Hexadecimal to decimal

i. 3A4. (2 Marks)

ii. $(1F.01B)_{16}$ (2 Marks)

Decimal to hexadecimal equivalent

i. 245_{10} to hexadecimal (2 Marks)

Binary fraction to hexadecimal

i. $(001100101.110111)_2$ (2 Marks)

13.

a) Differentiate between the following terms as used in computer storage:

i. Zip disk and Flash disk; (2 Marks)

ii. Primary and secondary storage. (2 Marks)

b) Explain FOUR Types of compact disks. (8 Marks)

c) Discuss FOUR types of Read Only Memory. (8 Marks)

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