

061306T4CSC

COMPUTER SCIENCE LEVEL 6

ICT/OS/CS/CC/01/6

Apply Basic Electronics

November/December 2025



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

WRITTEN

TEST

INSTRUCTIONS TO CANDIDATE

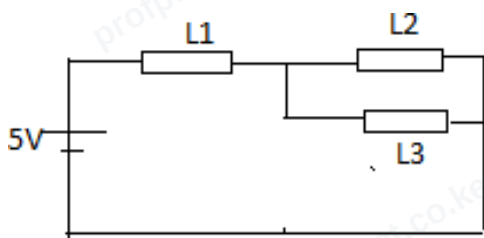
1. The paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and any **THREE (3)** questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. **DO NOT** write on this question paper.

This paper consists of FOUR (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. In an electronics workshop, you are testing different materials to determine their resistance levels. State FOUR factors you would consider you would consider. (4 Marks)
2. The figure below shows a closed circuit of three inductors L1, L2 and L3 of 0.5H, 1H and 2H respectively. Determine the equivalent inductance in the circuit (4 Marks)



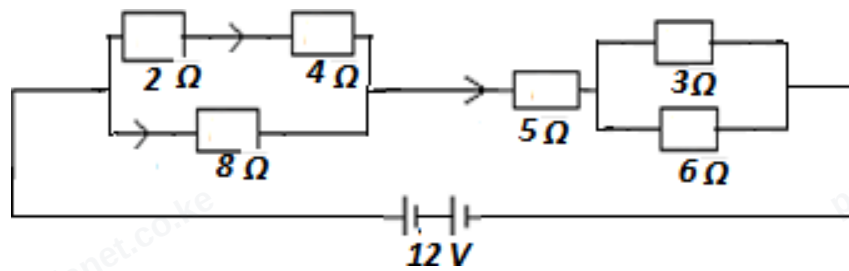
3. Determine the current in a closed circuit having two resistors connected in series of values 27Ω and 3.3Ω respectively with an EMF of 4.5V. (4 Marks)
4. In designing a practical circuit, explain _____ s you may choose to include inductors. (2 Marks)
5. A 60 W electric bulb is switched on an _____ r 5 hours. Calculate the total energy consumed by the bulb in kilowatt-hours (kWh). (4 marks)
6. In a lab exercise, you are required to illustrate a PNP transistor. Draw its circuit symbol and indicate the direction of current flow and voltages. (4 marks)
7. In computer systems, gray code is sometimes applied. Apart from its use in Karnaugh maps, describe TWO situations where gray code would be useful. (4 marks)
8. Modern computers use ROM in the manufacture of their memories. Explain TWO primary uses of ROM. (4 marks)
9. In a circuit, a resistor of 15Ω carries a current of 0.2 A. Using Ohm's Law, calculate the voltage drop across the resistor. (4 Marks)
10. In semiconductor manufacturing, Silicon and Germanium common semiconductors used in electronics. Identify TWO reasons why Silicon is preferred over Germanium. (2 Marks)
11. Convert the following decimal equivalent to their BCD numbers:

- a) 598 (2 marks)
- b) 96.72 (2 marks)

SECTION B (60 MARKS)

Answer Any THREE Questions in This Section

12. a) i. Draw a simple electronic circuit clearly indicating at least FOUR electronic components. (4 Marks)
- ii. Explain the function of each component in (i) above. (8 marks)
- b) Binary systems are used in programming. Explain FOUR reasons why it would be used in the design of an embedded hospital device. (8 marks)
13. a) As an electrical trainee, you are tasked to wire a simple DC circuit for lighting. Describe FIVE steps you would follow to ensure the circuit works safely. (10 Marks)
- b) In a practical test, the resist circuit is doubled while voltage remains constant. Explain TWO consequences of this. (4 Marks)
- c) Electronic circuits are widespread in our daily lives, from household devices to industrial systems. Explain THREE ways in which circuits are useful in real life. (6 marks)
14. a) An electrician is to choose between using integrated circuits or individual components. Explain THREE reasons that would convince the technician to use integrated circuits instead of the individual components. (6 marks)
- b) In electronics, forward biasing is a principle applied in semiconductor devices. Explain THREE real-life applications under forward biasing. (6 Marks)
- c) The rapid development of electronic components has changed the face of the electronic world. Explain FOUR examples of green electronics in the society. (8 marks)
15. a) As an electronics student, you are required to describe the structure of matter. Explain how this structure relates to the behavior of electrons in both conductors and semiconductors. (5 Marks)
- b) Six resistors are connected in a circuit as shown in the figure below.



Calculate:

- The total resistance of the circuit (6 marks)
- The total current in the circuit (3 marks)
- The current through the 3Ω resistor (3 marks)
- The voltage drops across 3Ω resistor (3 marks)