higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ELECTRONICS
NQF LEVEL 2

(10041012)

10 November 2022 (Y-paper)
13:00–16:00

This question paper consists of 6 pages.

221Q1N2210

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TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each section on a new page.
5. Use only a blue or black pen.
6. Write neatly and legibly.

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QUESTION 1

Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1–1.10) in the ANSWER BOOK.

1.1 The output of a NOT gate …

A will be logic 1 only if both the inputs are logic 1.
B will be logic 0 only if both the inputs are logic 0.
C will be logic 1 if one or both the inputs are logic 1.
D is always the inverse of the input.

1.2 Which one of the following is NOT a factor to consider when choosing a capacitor?

A Affordability
B Tolerance
C Leakage current
D Stability

1.3 Which one of the following is NOT a factor that influences resistance?

A The type of material
B Voltage
C The length of the conductor in metres
D The temperature coefficient of the material in kelvin (K) or degrees Celsius (ºC)

1.4 What is a formula for power?

A P = I x R
B P = V x I
C P = Q x T
D P = V x R

1.5 What is the meaning of the acronym OHSA?

A Occupational Health South Africa
B Organisational Health South Africa
C Occupational Health and Safety Act
D Organisational Health and Safety Act

1.6 What is a multimeter normally NOT able to measure?

A Distance
B Voltage
C Inductance
D Resistance

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1.7 What information will NOT appear on a job card?

A The symptoms or nature of a problem
B Wi-Fi password.
C Type of equipment to be repaired.
D Details of client.

1.8 Which of the following questions should you ask yourself when planning a job?

A What needs to be done?
B Where does it have to be done?
C None of the above.
D A and B

1.9 What is another name for a prototyping board or protoboard?

A Breadboard
B PC board
C Circuit board
D Electronic circuit board

1.10 A strip-board is also known as a …

A Breadboard
B PC board
C Circuit board
D Vero-board

(10 × 1) **[10]**

QUESTION 2

2.1 Name the TWO electrical charges. (2)

2.2 Draw the IEC symbol of a cell. (2)

2.3 Explain the process of doping intrinsic materials according to p-type and n-type semi-conductor principles. (4)

2.4 List any TWO types of resistors. (2)

2.5 Calculate the charge stored in a 5 µF capacitor when a voltage of 60 V is applied to it. (3)
[13]

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QUESTION 3

3.1 List the FOUR factors that the strength of an electromagnet depends on. (4)

3.2 Indicate whether the following statements are TRUE or FALSE. Write only 'True' or 'False' next to the question number (3.2.1–3.2.3) in the ANSWER BOOK.

3.2.1 Magnetic flux density or magnetic induction is the number of lines of force passing through a unit area of material.

3.2.2 Magnetic flux density is the amount of flux through a unit area taken perpendicularly to the direction of magnetic flux.

3.2.3 Magnetic flux density class 12 is a scalar quantity estimating the strength and direction of the magnetic field about a magnet or electric current.

(3 × 1) (3)

3.3 Name THREE ways to change magnetic flux through a loop. (3)

3.4 Explain the abbreviation CPR. (2)
[12]

QUESTION 4

4.1 List TWO workplace accidents that has to be reported to the Department of Labour within SEVEN days. (2)

4.2 Give a short description of an oscilloscope. (3)
[5]

QUESTION 5

5.1 How do you remove batteries from a test instrument? (6)

5.2 List THREE layout diagrams. (3)

5.3 Explain what a nuclear layout means. (3)
[12]

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QUESTION 6

6.1 What is the purpose of a solder sucker?

6.2 What is a *soldering flux*?

6.3 How do you dispose of PVC-covered cables?

6.4 What is meant by good housekeeping?

(4 × 2) **[8]**

QUESTION 7

7.1 What is meant by a visual inspection of a circuit before testing? (5)

7.2 List FOUR hand tools you would use while doing a soldering job. (4)

[9]

QUESTION 8

8.1 Draw a switch circuit of a NOR gate.

8.2 Convert the decimal number 11111 to its binary equivalent.

(2 × 2) **[4]**

QUESTION 9

Provide a table explaining the meaning of various indicator lights on a Programmable Logic Controller (PLC). **[17]**

QUESTION 10

Define each of the following telecommunication terms:

10.1 Sound

10.2 Wavelength

10.3 Computer

10.4 Crosstalk

10.5 Attenuation

(5 × 2) **[10]**

TOTAL: 100

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