higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ELECTRICAL WORKMANSHIP
NQF LEVEL 3

(120410132)

23 November 2023 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

251Q1N2323

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
ELECTRICAL WORKMANSHIP
NQF LEVEL 3
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. Use only a black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

1.1 Name FIVE tasks that an electrical company must do in terms of planning and scheduling before the start of a project. (5)

1.2 Name THREE personal factors that cause incidents in the workplace and give an example of each. (3 × 2) (6)

1.3 State FIVE safety precautions that you need to take when working in an electrical workplace. (5 × 2) (10)

1.4 List the duties of employers with regard to the health and safety of employees. (4)
[25]

QUESTION 2

2.1 List FIVE testing/measuring instruments used in electrical engineering. (5)

2.2 Refer to the diagram in FIGURE 1 below to answer the questions that follow.

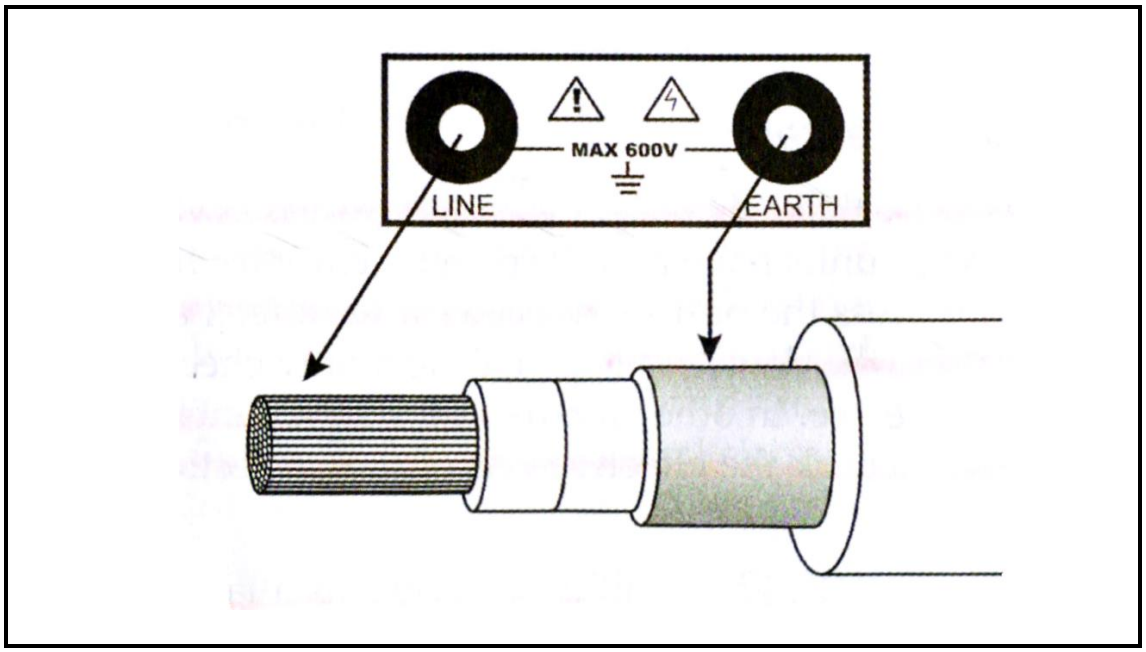

FIGURE 1

2.2.1 Name the test done in FIGURE 1. (2)

2.2.2 Explain the procedure for the test in FIGURE 1. (6)

2.3 State TWO factors that determine when and how many times a measuring instrument should be calibrated. (2)
[15]

QUESTION 3

3.1 Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–F) next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1.1	Heat is produced by an element that glows red hot when switched on	A	fan heater
3.1.2	The heating element at the base of the heater heats up the oil	B	magnetron
3.1.3	It controls the temperature by turning the element on or off automatically without human interaction	C	convection heater
3.1.4	It passes air over a heating element	D	thermostat
3.1.5	It is used to produce a very high frequency required for cooking	E	radiation heater
		F	stove plate

(5 × 1) (5)

3.2 An electric iron is a heating device used to iron clothes and other items made of fabric.

3.2.1 Explain the function of steam from the steam iron. (2)

3.2.2 Explain the principle of operation of a thermostat in an electric iron. (6)

3.3 Explain the aim of bonding according to the SANS 10142 regulations for domestic appliances. (2)

[15]

QUESTION 4

4.1 State SIX hazards to be taken into consideration when working on domestic appliances and power tools. (6)

4.2 Step 1 of the five-step fault-finding procedure is pre-assessment.

Name the remaining FOUR steps of the five-step fault-finding procedure. (4)

Do not explain them.

4.3 State FIVE specific factors to consider when maintaining and caring for a jigsaw. (5)

[15]

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QUESTION 5

5.1 As an electrician, you are given a task to install a single-phase AC machine in the workshop.

State SIX steps you will follow to plan the electrical task successfully. Include all activities that are to take place from the planning stage up to the last stage where the AC machine has been successfully installed. (6)

5.2 Series resistance or applied voltage control is one of the methods used to control the speed of a universal motor.

5.2.1 Draw a circuit diagram of the above-mentioned method. (4)

5.2.2 Name the other TWO methods that are used to control the speed of a universal motor. (2)

5.3 Name THREE types of bases on which motors are mounted. (3)

[15]

QUESTION 6

6.1 List FIVE factors that must be considered when selecting an electrode suitable for an arc welding job. (5)

6.2 Define the term *hazard.* (2)

6.3 List FOUR major hazards associated with arc welding. (4)

6.4 Explain the following terms regarding welding areas:

6.4.1 Working space

6.4.2 Ventilation

(2 × 2) (4)

[15]

TOTAL: 100

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