higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE (VOCATIONAL)

## ELECTRICAL WORKMANSHIP
## NQF LEVEL 3

(12041013)

**7 Maart 2018 (X-Paper)**
**09:00–12:00**

**This question paper consists of 5 pages.**

NCV

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**TIME: 3 HOURS**
**MARKS: 100**

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**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. Write neatly and legibly.

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## QUESTION 1

1.1 List FIVE activities that you must consider when planning and scheduling the work is done. (5)

1.2 Name FIVE points to consider when drawing up a task list. (5)

1.3 Name THREE possible incidents that could happen in the workplace or to people if an employee does not perform the lock out procedure. (3)

1.4 State at least THREE precautionary measures that should be taken when working with motors and generators to eliminate, isolate or reduce the following hazard:

Noise level too high. (3)

1.5 Explain the THREE functions of health and safety committees. (6)

1.6 Name THREE steps that employers can take to prevent injuries and illness in the workplace. (3)

**[25]**

## QUESTION 2

2.1 Analogue test instruments are very sensitive and need to be calibrated regularly.

2.1.1 Explain how you would calibrate or zero set an analogue multi-meter. (3)

2.1.2 What is the parallax error when using an analogue meter? (1)

2.2 What do we use the following test instruments for?

2.2.1 A tachometer

2.2.2 An earth leakage/polarity tester

(2 × 1) (2)

2.3 Name TWO precautions when caring for test instruments. (2)

2.4 By means of a sketch, show the connection diagram for a primary wound current transformer. (4)

2.5 List THREE steps that need to be followed when installing and connecting electrical metering and measuring equipment. (3)

**[15]**

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## QUESTION 3

3.1 Explain the operation of an automatic kettle. (5)

3.2 Draw the circuit diagram of a three heat stove switch. (5)

3.3 With regard to the regulations extracts from SANS 10142-1:2012, state how bonding is done on a geyser. (3)

3.4 What is the difference between the thermal operating principle of kettle and an electric iron? (2)

**[15]**

## QUESTION 4

4.1 State TWO possible maintenance procedures that should be carried out on an electric kettle. (2)

4.2 Name FOUR safety precautions when working on appliances and power tools. (4)

4.3 You are an appliance repair technician. Two faulty appliances are handed in for repairs.

What are the possible causes of the faulty appliances below?

4.3.1 Your customer says that her electric iron pilot light does not switch on and that the iron does not get hot. (6)

4.3.2 The customer says that when the kettle is switched on the pilot light comes on, but the water does not boil. (2)

4.4 Which test instrument would you use to test how good the insulation is between an element and earth? (1)

**[15]**

## QUESTION 5

5.1 Explain the process of planning an electrical task to successfully install and commission single phase AC motors and switch gear. (6)

5.2 Draw the fully labelled circuit diagram of a capacitor-start induction-run motor. (6)

5.3 Name THREE tests that must be done on the motor once an electrical motor has been installed. (3)

**[15]**

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**QUESTION 6**

6.1 List FOUR types of PPE required when doing SMAW work. (4)

6.2 Name THREE major hazards to beware of when welding metals together. (3)

6.3 Name the TWO main types of electrodes used in the SMAW process. (2)

6.4 Explain the following terms as used in SMAW.

6.4.1 Polarity

6.4.2 Amperes

6.4.3 Alternating current

6.4.4 Direct current

(4 × 1) (4)

6.5 Briefly explain how you would clean a welded joint after completing it. (2)

**[15]**

**TOTAL: 100**

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