higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T660(**E**)(A9)T

NATIONAL CERTIFICATE

FAULT FINDING AND PROTECTIVE DEVICES N4

(8080104)

9 April 2018 (X-Paper)
09:00–12:00

This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
FAULT FINDING AND PROTECTIVE DEVICES N4
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. Write neatly and legibly.

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QUESTION 1

1.1 Describe the basic philosophy of fault finding. (3)

1.2 Explain the following which fall under the nine-point plan:

1.2.1 What are the facts?

1.2.2 What is the problem?

1.2.3 Examine the records.

1.2.4 Communicate with the people involved.

1.2.5 Determine what rules are applicable.

(5 × 3) (15)
[18]

QUESTION 2

2.1 Describe the operations of Wheatstone. (8)

2.2 Draw a diagram of an automatic hand operated star delta. (10)
[18]

QUESTION 3

3.1 Define *ohm*. (2)

3.2 Explain *hysteresis loss* with regard to inductance. (3)

3.3 3.3.1 Name TWO types of polarised capacitors. (2)

3.3.2 Name THREE types of nonpolarised capacitors. (3)

3.4 State THREE factors that can influence capacitance. (3)

3.5 What does an electromagnetic field consist of? (4)
[17]

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QUESTION 4

4.1 State the function of each of the following components:

4.1.1 Time-base generator

4.1.2 Electron gun

(2 × 2) (4)

4.2 A relay and a contactor are both electromagnetic switches.

State the difference between the TWO components. (2 x 2) (4)

4.3 Discuss in your own words why a voltage tester is used. (4)

4.4 Draw a single-phase half-wave circuit, showing the waveforms. (6)

[18]

QUESTION 5

5.1 Complete the following sentence by writing only the missing word(s) next to the question number (5.1.1–5.1.5) in the ANSWER BOOK:

Frequency (5.1.1 …), using Lissajous patterns, is often (5.1.2 …) on the CRO, when a (5.1.3 …) is formed by two (5.1.4 …) amplitude signals, with only a small (5.1.5 …) in their frequencies. (5)

5.2 A Lissajous figure is used to compare two oscillators, one with a frequency of 1 000 Hz and the other with a frequency of 1 001 Hz.

What is the purpose of CRT during this process? (2)

5.3 Define *double images*. (3)

5.4 What determines the types of patterns when two signals of the same frequency are applied? (2)

5.5 Define *triggering*. (2)

[14]

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QUESTION 6

6.1 Discuss the term *deflecting plates* of an oscilloscope. (4)

6.2 What is the purpose of decoupling capacitors in a transistor circuit? (2)

6.3 Discuss FIVE methods used to identify a transistor. (5)

6.4 Discuss the operations of the SCR using two transistors. (4)
[15]

TOTAL: 100

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