higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T660**(E)**(A7)T

NATIONAL CERTIFICATE

FAULT FINDING AND PROTECTIVE DEVICES N4

(8080104)

7 August 2019 (X-Paper)
09:00–12:00

This question paper consists of 4 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. Sketches must be large, neat and fully labelled.
5. Write neatly and legibly.

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QUESTION 1

1.1 State FIVE factors and their relevant questions with reference to the nine-point plan regarding fault finding. (5 × 2) (10)

1.2 Name, with reference to the nine-point plan, THREE methods to apply when collecting facts. (3)

1.3 State any EIGHT elements of the nine-point plan regarding fault finding. (8 × ½) (4)

[17]

QUESTION 2

2.1 Draw a three-phase control circuit of a forward and reverse motor. (8)

2.2 Name THREE uses of an inching circuit. (3)

2.3 List NINE maintenance-record systems. (9)

2.4 Name TWO rules a person should know if he/she wants to become more effective in fault-finding techniques. (2)

[22]

QUESTION 3

3.1 State THREE factors that influence capacitance. (3)

3.2 Name SIX types of capacitors. (6)

3.3 Name TWO types of overload protection. (2)

3.4 State EIGHT common problems that occur when using testing equipment and misleading results are obtained. (8)

[19]

QUESTION 4

4.1 Draw a simple sketch of a cathode-ray tube. (6)

4.2 Explain the term *inductance.* (2)

4.3 What are the advantages of metal-oxide resistors? (3)

4.4 Explain how conventional current flows through an NPN transistor when it is forward biased. (6)

[17]

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QUESTION 5

5.1 Draw the characteristic curve of a germanium diode. (5)

5.2 Determine the maximum value of a Zener-diode current.

Given: 5,5 volts, 500 megawatts, 10% tolerance (3)

5.3 Draw an SCR two-transistor equivalent circuit and explain its operation. (6)
[14]

QUESTION 6

6.1 Draw the truth table and electrical circuit of a three-input OR gate. Label the electrical circuit. (6)

6.2 Draw the symbol of an AND gate with TWO inputs. (2)

6.3 Simplify the following expression:

$Q = ABC + A\bar{B}C + AB\bar{C}$ (3)
[11]

TOTAL: 100

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