higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T680**(E)**(M26)T

NATIONAL CERTIFICATE

FAULT FINDING AND PROTECTIVE DEVICES N6

(8080126)

26 March 2018 (X-Paper)
09:00–12:00

Calculators may be used.

This question paper consists of 4 pages.

Copyright reserved

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
FAULT FINDING AND PROTECTIVE DEVICES N6
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.

Copyright reserved

QUESTION 1

1.1 Name 16 maintenance checks on a bank of lead/acid cells already in use. (8)

1.2 Explain what is meant by the final voltage concerning lead/acid cells. (2)

1.3 Name FIVE tests that can be carried out on a new nickel/cadmium cell. (5)
[15]

QUESTION 2

2.1 Explain each of the following concerning protection schemes:

2.1.1 Inverse time-delay circuit

2.1.2 Discrimination

2.1.3 Stability

2.1.4 Reliability

(4 × 2) (8)

2.2 Name FIVE different items of equipment of which a protection system basically consists. (5)

2.3 Name THREE disadvantages of graded time protection. (3)

2.4 Draw a simple labelled diagram of an attracted armature relay. (6)
[22]

QUESTION 3

3.1 Explain the purpose of surge arrestors. (5)

3.2 Give 12 reasons why an oil circuit breaker may not to close. (6)

3.3 Give 12 reasons why an oil circuit breaker may not to open. (6)
[17]

QUESTION 4

4.1 Draw a fully labelled sketch of the Bucholtz relay. (7)

4.2 How would you protect a transformer against overcurrent? (2)

4.3 State EIGHT principles used in transformer protection. (8)
[17]

Copyright reserved

QUESTION 5

5.1 State FIVE limitations of the Murray loop-test method compared to other methods of cable fault location. (5)

5.2 Name THREE faults usually occuring in cables. (3)

5.3 Give the AC test voltages for each of the following PVC cables between conductors and between any conductors and earth for flexible cables:

5.3.1 300/500 V

5.3.2 600/1 000 V

(2 × 2) (4)
[12]

QUESTION 6

6.1 Draw a fully labelled block diagram of a logic probe. (10)

6.2 Name FOUR sources of speed signal control for feedback loop control. (4)

6.3 What is a *logic pulser*? (2)

6.4 What is a *metal-oxide varistor*? (1)
[17]

TOTAL: 100

Copyright reserved