higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

FAULT FINDING AND PROTECTIVE DEVICES N6

(8080126)

30 July 2021 (X-paper)
09:00–12:00

Drawing instruments may be used.

This question paper consists of 4 pages and 1 diagram sheet.

108Q1G2130

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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. Start each question on a new page.
5. Only use a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

1.1 Name FOUR factors to be considered when choosing a cell for a certain application. (4)

1.2 Name SIX tests that can be carried out on a nickel-cadmium cell. (6)

1.3 Concerning lead acid cells, explain the term *floating charge.* (3)
[13]

QUESTION 2

2.1 Draw a diagram of an induction overcurrent relay. (6)

2.2 State THREE methods of grading induction relays to obtain selective operation. (3)

2.3 Name SIX types of protection relays. (6)

2.4 Draw and explain the operation of a simple electromagnetic overload relay. (6)
[21]

QUESTION 3

3.1 Explain the purpose of lightning arresters. (5)

3.2 Design a system to ensure safe working conditions when work is to be carried out on the transformers A, B, C and bus section D.

Fill in the key numbers on the DIAGRAM SHEET (attached) and fully explain the operation of the interlocking system and key operation. Place the completed diagram sheet in the ANSWER BOOK. (10)
[15]

QUESTION 4

4.1 Explain how you would carry out a crackle test to check whether water is present in a transformer. (3)

4.2 Make a fully labelled sketch of a thermometer bulb in an oil tank to measure temperature. (7)

4.3 Name SEVEN conditions for transformers to operate in parallel. (7)
[17]

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QUESTION 5

5.1 State SIX causes of faults in cable joints. (6)

5.2 Name FOUR methods to reduce stress in cables. (4)

5.3 Explain, with the aid of a simple sketch, the cyclic flashing method to locate a fault on a cable. (6)

[16]

QUESTION 6

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

6.2 What is the aim of a current feedback loop in a direct current drive? (3)

6.3 Describe the method you would use to establish whether a fault is in the main thyristor drive or in the trigger unit. (3)

6.4 Define the term *logic pulser*. (2)

[18]

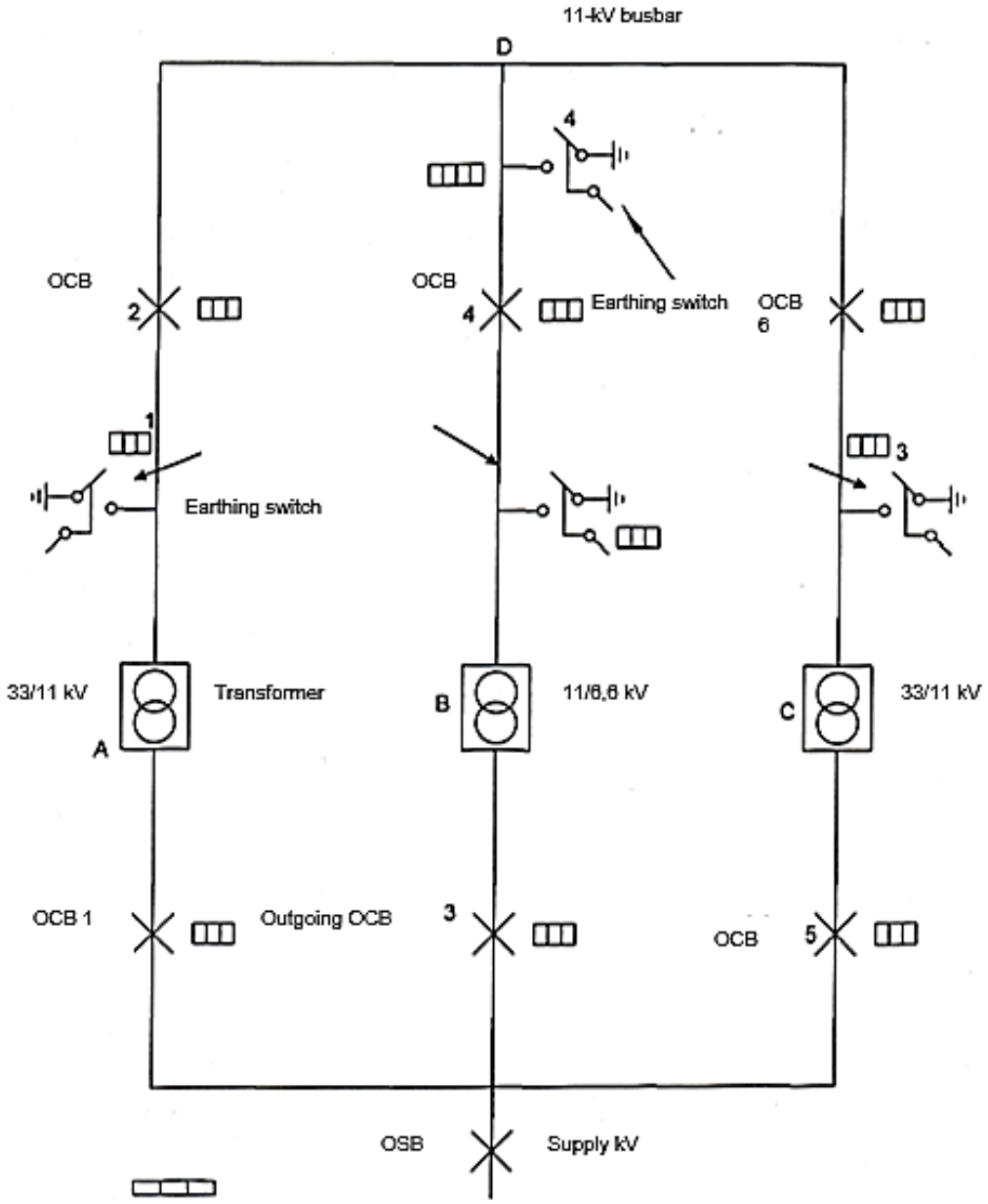
TOTAL: 100

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DIAGRAM SHEET

EXAMINATION NUMBER:

QUESTION 3.2



NOTE: Castle key numbers to be filled in correct sequence.
NOTE: Place the completed DIAGRAM SHEET in the ANSWER BOOK.

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