

T130

Friday, 23/7/2021

08:30 – 11:30 AM

Names

Index number

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

QUESTIONS and ANSWERS BOOKLET

OPTION/TRADE: SOLAR ENERGY

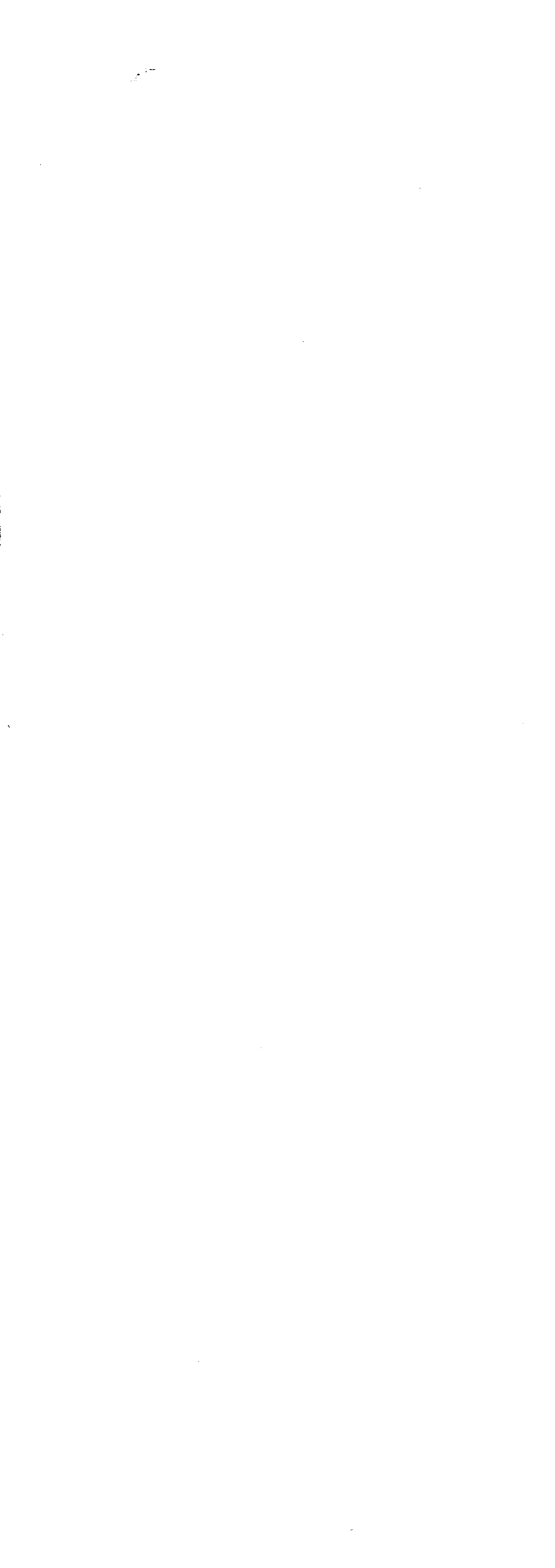
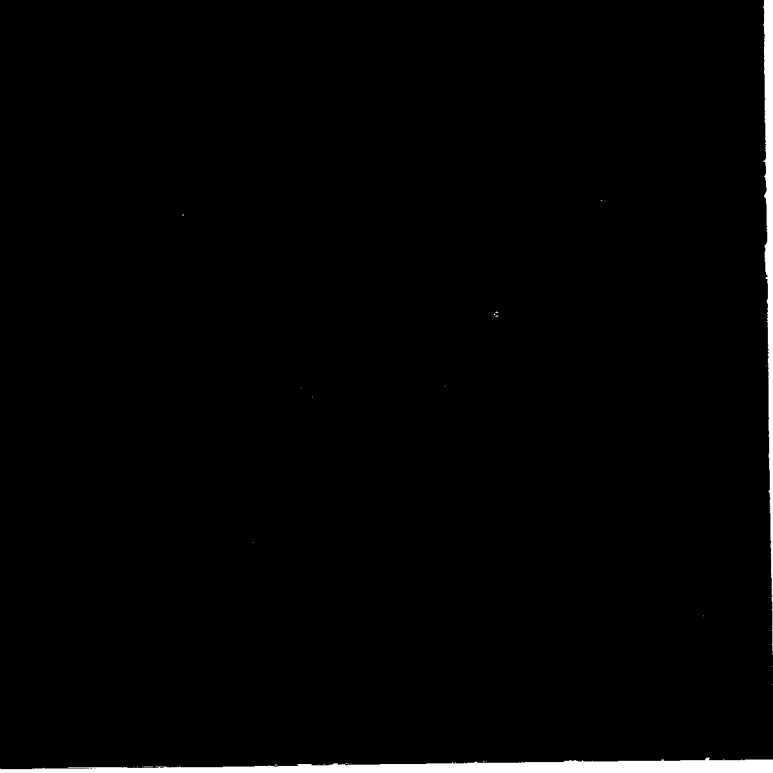
SUBJECT: Substation installation and maintenance

ACADEMIC YEAR: **2020-2021**

Read carefully the instructions on page (i) & (ii).

FOR EXAMINER'S USE ONLY

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TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

INSTRUCTIONS TO CANDIDATES: PART I (Answer Booklet)

1. A candidate should fill in the actual names and the index number on the cover of this questions and answer booklet on the provided place (Black Box).
2. It is illegal for a candidate to write any of his/her names, index number or a school name inside the answer booklet.
3. A candidate should check if all pages of the answer booklet are complete. No candidate should remove or tear any pages or part of it from the answer booklet.
4. A candidate should answer in the language in which the examination is set. (See page **(ii)**)
5. A candidate should sign on the sitting plan when submitting the answer booklet. He/she has also to check if the answer booklet is well sealed.
6. No extra paper is allowed in the examinations room. If a candidate is caught with it his/her results will be nullified.
7. No candidate is allowed to write answers not related to the subject being sat for, otherwise it will be considered as a cheating case.
8. Write your answers on the 12 lined pages (From page 1 of 12 to page 12 of 12).
9. Use the last non-lined pages as draft.
10. Results for any candidate who is caught in examination malpractices are nullified. The cheating can be recognized during examinations administration, marking exercise or even thereafter.

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

OPTION/TRADE: SOLAR ENERGY

SUBJECT: Substation installation and maintenance

DURATION: 3 hours

INSTRUCTIONS TO CANDIDATES: PART II(Question Paper)

The paper is composed of two (2) Sections as follows:

Section I: Attempt all the Twelve (12) questions	(60 marks)
Section II: Attempt any Four (4) questions out of Six (6)	(40 marks)

Allowed materials:

- Ruler or square
- Calculator

Note:

Every candidate is required to carefully comply with the provided assessment instructions.

Section I : Attempt all the Twelve (12) questions

(60 marks)

01. Identify any five (5) types of substations.

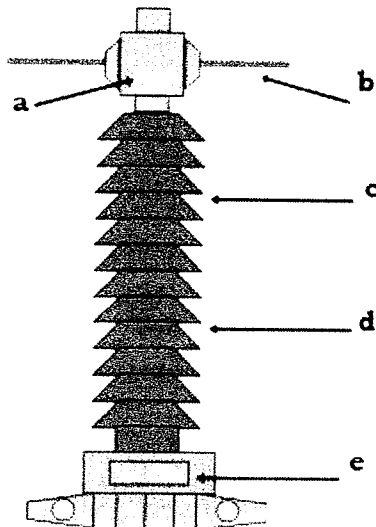
(5 marks)

02. Power transformers employ different cooling techniques. Explain each technique:

- a) **AN**
- b) **AF**
- c) **ONAN**
- d) **OFAF.**

(5 marks)

03. Complete the parts of image below:



(5 marks)

04. Indicate any four (4) advantages of vacuum circuit breaker.

(5 marks)

05. Identify any five (5) testing instruments used for testing substation installation.

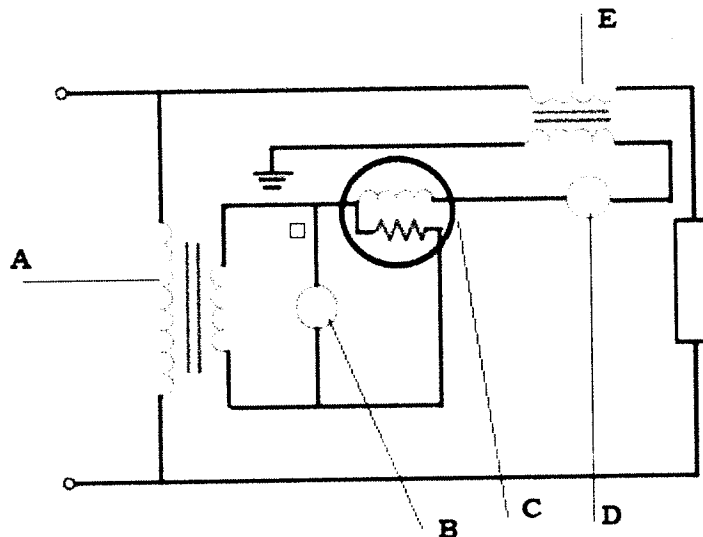
(5 marks)

06. Identify any five (5) information (data) contained in trouble report of substation.

(5 marks)

07. Enumerate any five (5) types of overcurrent relay. **(5 marks)**

08. Identify the name of the following elements represented in the diagram below:



(5 marks)

09. Mention any five (5) main functions of substations. **(5 marks)**

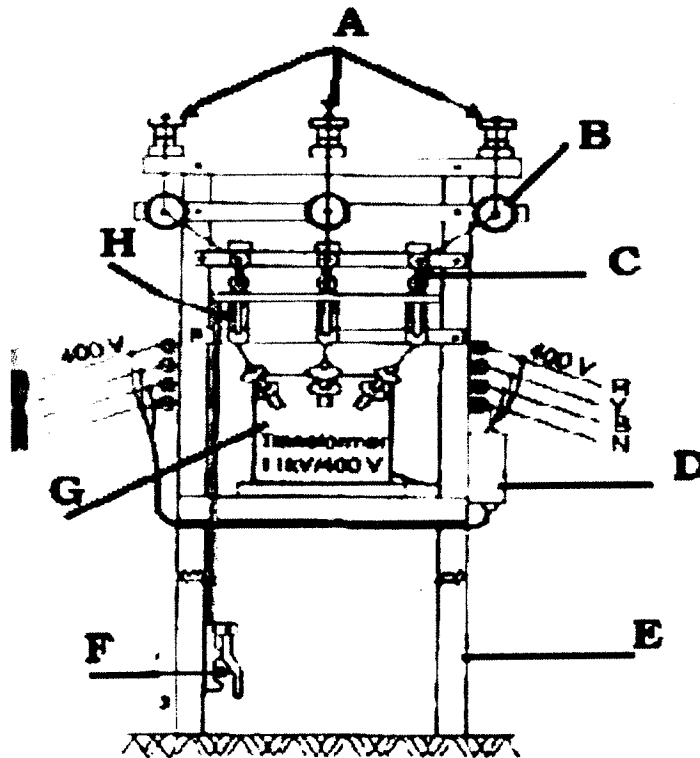
10. Classify equipment used to maintain substation. **(5 marks)**

11. List any five (5) tasks to be performed when you make visual inspection of power transformer. **(5 marks)**

12. List down five PPE used for maintaining substation and indicate the role of each. **(5 marks)**

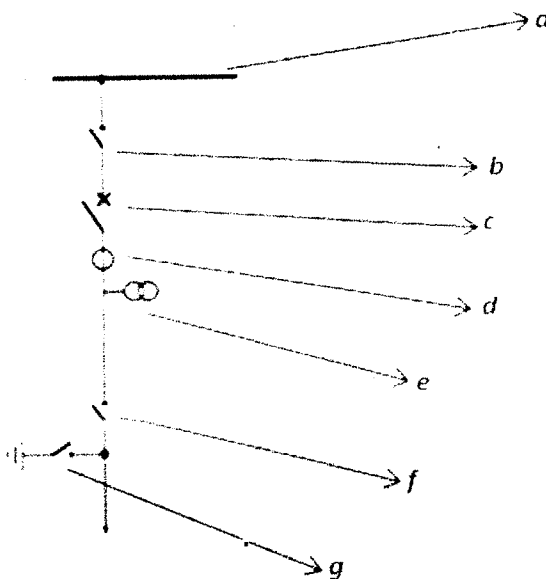
Section II: Attempt any Four (4) questions out of Six (6) (40 marks)

13. After founding out the name of the figure below, identify the names of its parts.



(10 marks)

14. After defining the term “substation”, identify the name of the following elements of Substation:



(10 marks)

15. Identify at least ten (10) tools and hand machines used while performing substation installation and their corresponding roles.

(10 marks)

16. List down and explain five (5) types of maintenance.

(10 marks)

17. a) Oil leakage from screw joint is one of the failures of transformer, what are the three possible causes and their remedies action?

Location	Possible causes	Remedial action
From screw joints

b) H.V Bushing flashover is one of the failures of transformer, what are the two possible causes and their remedies action?

Types of failure	Possible causes	Remedial action
H.V bushing flashover		

(10 marks)

18. List and explain four (4) maintenance procedures followed while performing maintenance activity.

(10 marks)

