NESA NATIONAL EXAMINATION AND SCHOOL INSPECTION AUTHORITY

HPE – Electrical Generators and Motors Operations

T089

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: **HYDROPOWER ENERGY**

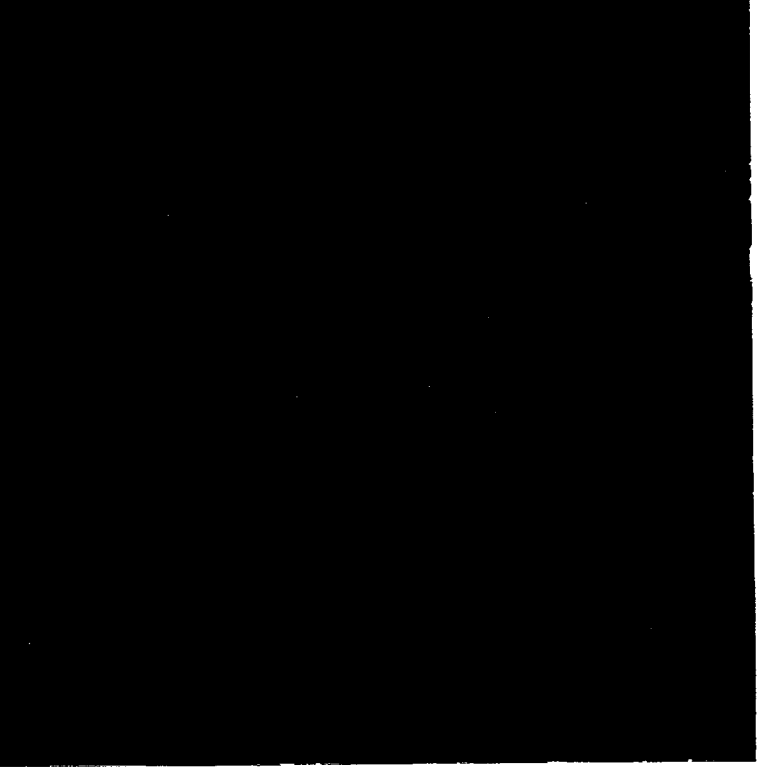
SUBJECT: **Electrical Generators and Motors Operations**

ACADEMIC YEAR: **2020-2021**

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

FOR EXAMINER'S USE ONLY

QUESTIONS	1	2	3	4	5	6	7	8	9	10	Total
Marks											
QUESTIONS	11	12	13	14	15	16	17	18	19	20	Total
Marks											
QUESTIONS	21	22	23	24	25	26	27	28	29	30	Total
Marks											



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: HYDROPOWER ENERGY

SUBJECT: Electrical Generators and Motors Operations

DURATION: 3 hours

INSTRUCTIONS TO CANDIDATES: PART II (Question Paper)

The paper is composed of two (2) main 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 and 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)**

1. Identify any five (5) advantages of a contactor. **(5 marks)**

2. Explain the basic working principle of a DC generator. **(5 marks)**

3. The three phase induction motor is running and produces a humming What are the five (5) possible causes? **(5 marks)**

4. Mention any five (5) applications of single-phase asynchronous generator. **(5 marks)**

5. Identify any five (5) characteristics of MCB. **(5 marks)**

6. Enumerate at least five (5) parameters written on name plate of three phase induction motor. **(5 marks)**

7. What are the procedures of installing an electrical generator? **(5 marks)**

8. When a DC Motor is running and produces high spark at the commutator, what are the five (5) possible causes of this defect? **(5 marks)**

9. List down any five (5) generator conditions (parameters) you have to check before starting it. **(5 marks)**

10. List down at least five (5) PPE used while operating electrical motor.

(5 marks)

11. What is the basic information indicated on the electrical generator's nameplate? (List any five: 5). **(5 marks)**

12. Draw the symbols of electrical devices, components and machines listed below:

a) DC power supply

b) Alternator.

c) Battery power supply

d) Variable resistor. **(5 marks)**

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

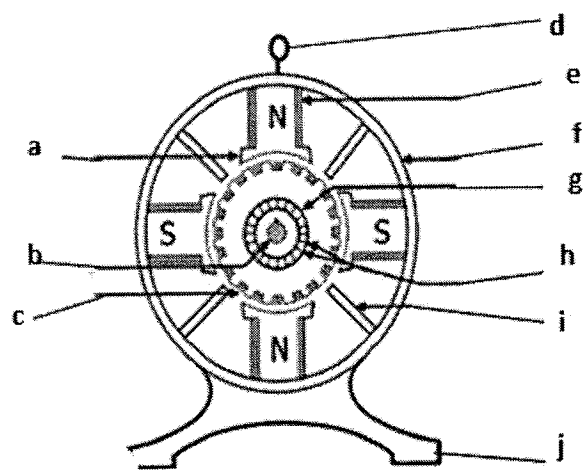
13. List down any five (5) advantages and disadvantages of Direct Online (DOL) starting method of three phase induction motor. **(10 marks)**

14. a) Explain briefly the working principle of single-phase asynchronous generator.

b) Indicate the role of the following parts of three phase motor:

i. Stator
ii. Rotor
iii. Shaft
iv. Bearings
v. Bolt and nuts or screws **(10 marks)**

15. A DC Motor has many parts, indicate the names of the parts of DC motor represented hereunder:



(10 marks)

16. What are the possible causes of the following electrical generators' (alternators) faults? (Give 3 causes for each fault)

a) The generator is running but there is no output.

b) Abnormal frequency

c) Generator is overheated **(10 marks)**

17. A long-shunt compound generator delivers a load current of 50 A at 500 V and has armature, series field and shunt resistances of 0.05Ω, 0.03Ω and 250Ω respectively. Calculate: the generated voltage and the armature current. Allow 1 V per brush for contact drop. **(10 marks)**

18. List down and describe five (5) types of single-phase generators.

(10 marks)

NESA2021