

**CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD**  
Technical and Vocational Education Examinations



**ELECTRICAL POWER SYSTEMS**

**ELECTRICAL MACHINES 3**  
**5235**

**JUNE XXXX**

**INTERMEDIATE LEVEL**

Subject Title	<b>ELECTRICAL MACHINES</b>
Subject Code No.	<b>5235</b>
Paper No.	<b>THREE</b>

**DURATION 1 HOUR 30 MINUTES**

This PAPER is a practical paper and has a weighting of 40%. Candidates are to **BALLOT** in order to get the TOPIC to work on.

In this paper, each candidate has to elaborate on the preparatory work which includes: Title; Aim; Principle (Theoretical diagram, formulae, expected curves, etc.); List of Materials and Table of values.

Each candidate has to carry out the manipulation and write a report in an invigilated room.

**MARKING SCHEME**

<b>EXERCISE</b>	<b>DURATION (MINUTES)</b>	<b>MARKS</b>
PREPARATORY WORK	40	40
MANIPULATION	30	40
CONCLUSION	20	20
<b>TOTAL</b>	<b>90</b>	<b>100</b>

**You are reminded of the necessity for good English and orderly presentation in your answers.**

*Turn Over*

### TOPIC 1: STUDY OF A SEPARATELY EXCITED DC GENERATOR ON NO- LOAD

Given a D.C. generator with the following characteristics

$P_n = 3\text{KW}$ ,  $V_n = 220\text{V}$ ,  $I_n = 15\text{A}$ ,  $N_n = 1500\text{rpm}$

You are expected to carry out a No-load test on this motor and determine:

- a) The values of the armature and field resistances.
- b) The No- load characteristics  $E = f(i_f)$
- c) The value of the residual emf; ( $E_o$ )

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### TOPIC 2: STUDY OF A SINGLE PHASE TRANSFORMER ON NO- LOAD

You are given a 220V/24V, 50Hz, 160VA transformer

Carry out a No-load test on this transformer and:

- a) Determine the transformation ratio
- b) Draw the magnetisation curve  $E_2 = f(I_1)$

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### TOPIC 3: STUDY OF A THREE PHASE INDUCTION MOTOR

Using the voltmeter ammeter method, determine the resistance of one winding of a three phase induction motor whose windings are coupled in;

- a)
  - (i) Star
  - (ii) Delta
  - (iii) Windings neither in Star nor in Delta
- b) Compare the values obtained in (a) and conclude

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### TOPIC 4: THREE PHASE POWER

Using the two wattmeter method on a three phase inductive load, determine;

- a) The active power  $P$
- b) The apparent power  $S$
- c) The reactive power
- d) The power factor the motor

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### TOPIC 5: MEASUREMENT OF INDUCTANCE

Using the Joubert's Method, determine the inductance of a motor winding.

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