UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 6 Examination in Engineering: May 2026

Module Number: MN6302 **Module Name: Electro Technology - I (C23)**

[Three Hours]

Instructions to candidates:

1. There are **6 Questions** on **2 Pages**.
2. Answer **only 05** questions. Each question carries **14 Marks**.
3. Maximum marks allocation for each question is shown.
4. Start your answers to each question on a fresh page.
5. This paper carries 70% of the total module marks of 100%.
6. Non-programmable calculators may be used
7. Drawing and sketches should be clear, neat and in approximate proportion.
8. Do not use red ink.

Q1. a) Draw a 3 in 1 line diagram showing a marine power distributing system.

(04 Marks)

b) Name the types of circuit breakers and the different positions of a breaker.

(03 Marks)

c) Explain the most widely used circuit breaker type on ships.

(05 Marks)

d) What are the methods of tripping which can be initiated?

(02 Marks)

Q2. a) A 79.5 μF capacitor is connected in series with a non-inductive 30 Ω resistance across a 100 V, 50 Hz supply. Find the following,

i. Impedance
ii. Current
iii. Phase angle.

(09 Marks)

b) State the types of electrical diagrams. Which is the most important one?

(05 marks)

Q3. a) Define insulation resistance and explain its importance in electrical equipment.

(06 Marks)

b) Briefly explain the commissioning procedure for a seawater flooded windlass motor on the weather deck.

(08 Marks)

Q4. a) Name the advantages and disadvantages of induction motors.

(02 Marks)

b) A 50 Hz, 4 pole, 3 phase induction motor has an induced rotor current of frequency 2 Hz. Determine the following,

i) The percentage slip

ii) Speed of the motor.

(04 Marks)

c) A 3 phase induction motor is a self-starting motor. Explain the reason to use several starting methods for it?

(04 Marks)

d) What is the most common cause of induction motor failure?

(04 Marks)

Q5. a) By using the circuit diagram briefly explain the basic refrigeration motor control.

(04 Marks)

b) With the circuit diagram briefly explain the Ward Leonard speed control method.

(10 Marks)

Q6. a) What will happen to the running 3 phase induction motor if becomes single phasing due to one of the supply line failure? Explain with a sketch.

(08 Marks)

b) With a sketch explain the capacitor start & run single phase induction motor operation.

(06 Marks)