

TECHNICAL UNIVERSITY OF MOMBASA

School of Engineering and Technology

Department of Electrical and Electronic engineering

Diploma in Electrical Power Engineering

ELECTRICAL DRIVES AND CONTROL

EEP 2304

END OF SEMESTER IV EXAMINATION

SERIES: MAY 2025

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **five** Questions;. Attempt any **THREE** Questions.

Do not write on the question paper.

Question ONE

- (a) (i) Define an electric drive.
(ii) State the classification of drives.

(5 marks)

- (b) State **FIVE** advantages of electric drives over other drives (5 marks)
(c) Explain **FOUR** factors to be considered in the selection of drive. (10 marks)

Question TWO

- (a) Draw the block diagram of a general electric drive system and explain each block (6marks)
(b) Draw the diagram and explain the operation of the 4 quadrant electric drive. (6 marks)
(c) Describe Four types of power modulators stating the function of each (8 marks)

Question THREE

- (a) Explain the cause of drive freewheeling. (2 marks)
(b) Explain **THREE** methods of electric braking. (6 marks)
(c) (i) State **TWO** methods of speed control in DC motors.
(ii) Six methods of speed control in AC motors. (8 marks)
(d) (i) Explain the need for a motor enclosure.
(ii) Describe **THREE** motor enclosures. (4 marks)

Question FOUR

- (a) Explain **THREE** motor drive ratings. (6 marks)
(b) Draw the heating and cooling curve of an electric motor drive. (5 marks)
(c) A motor for a varying load drives a 20kW load for two minutes, 10 kW for Three minutes and is stopped three minutes and the cycle is repeated.

Determine the continuous rating of motor for this duty cycle.

(9 marks)

Question FIVE

- (a) Explain **FOUR** ways in which the speed of an electric motor can be controlled.
(8marks)
- (b) Draw a circuit of diagram of a 3 phase cyclo converter drive system and explain its operation.
(6 marks)
- (c) Draw the circuit of a controlled rectifier fed single phase two quadrant d.c drive.

(6 marks)