



# *TECHNICAL UNIVERSITY OF MOMBASA*

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*Faculty of Engineering and Technology*

*Department of Electrical and Electronic engineering*

**UNIVERSITY EXAMINATION:**

*Diploma in Electrical Power Engineering (DEPE 6)*

**ELECTRICAL DRIVES AND CONTROL II**

**EEP 2304**

**END OF SEMESTER EXAMINATION**

**SERIES: MAY 2016**

**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.**

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### Question ONE

- (a) (i) Define an electric drive.  
(ii) Explain FOUR factors to be considered in the selection of drive. (10 marks)
- (b) State;  
(i) FIVE advantages of electric drives.  
(ii) classification of drives. (7 marks)
- (c) Distinguish between active Load torque and passive load torque. (3 marks)

### Question TWO

- (a) Draw the block diagram of a general electric drive system and explain each block. (10 marks)
- (b) Draw the diagram and explain the operation of the 4 quadrant electric drive. (10 marks)

### Question THREE

- (a) Explain **FOUR** ways in which the speed of an electric motor can be controlled. (8 marks)
- (b) Draw a circuit of a 3 phase cyclo converter drive system and explain its operation. (6 marks)
- (c) Draw the circuit of a single phase controlled rectifier 4 quadrant DC drive and indicate the quadrant each converter operates (6 marks)

### Question FOUR

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

(9 marks)

**Question FIVE**

- (a) State **FOUR** reasons why induction motors are widely used for drives. (4 marks)
- (b) State the Losses in an induction motor drive and how arise. (7 marks)
- (c) Explain Three methods of Induction motor braking. (9 marks)