



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN TECHNOLOGY (ELECTRICAL & ELECTRONICS ENGINEERING)(CEEE3)

EEE 1202 : INDUSTRIAL ELECTRONICS

END OF SEMESTER EXAMINATION

SERIES: MAY 2016

TIME: 2 HOURS

DATE: MAY 2016

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) Describe THREE modes of heat transfer

(ii) With the aid of a sketch explain the operation of eddy currents heating

(9marks)

(b)(i) State any TWO applications of the following electric heating methods

- I. Resistance heating
- II. Dielectric heating
- III. Induction heating

(3marks)

(ii) With the aid of a diagram and an equivalent circuit explain the operation of dielectric heating

(8marks)

Question TWO

a) (i) State any THREE general requirements for alarm systems

(ii) With the aid of a block diagram explain the operation of a typical alarm system.

(10marks)

(b) (i) State any TWO transducers used in each of the following physical variables

- I. Load
- II. Position
- III. Velocity
- IV. Temperature

(ii) State the limitations of remote transducers and how these limitations are overcome.

(10marks)

Question THREE

(a) State with reasons the most appropriate type of electric heating to be applied for each of the following:

- i. Surface hardening of metals
- ii. Cooking pot
- iii. Curing of sand cores in foundries

(6marks)

(b) (i) Explain any THREE temperature control techniques for resistance ovens

(ii) List any TWO desirable properties of resistance heating.

(8marks)

c) Explain any FOUR advantages and any TWO disadvantages of electric heating in comparison with fossil fuels.

(6marks)

Question FOUR

(a) (i) State any TWO advantages of a thyristor as a switch over mechanical switching

(ii) Draw the anode characteristics of the SCR and explain the shape.

(7marks)

(b) (i) With the aid of a construction diagram explain the operation of the light emitting diode

(6marks)

(ii) State the elements and voltages applied to give the following light colours in LEDs

- I. Blue
- II. Green
- III. Orange

IV. Red

(iii) Explain any TWO applications of LEDs

(7marks)

Question FIVE

(a) Explain the following types of closed circuit television camera CCTV

- i. Remote operation type
- ii. Self contained (Monoblock)

(7marks)

(b)(i) State the application of a load cell

(ii) With the aid of a diagram explain the operation of a load cell

(9marks)

c) Explain the following thermal sensors used in alarm circuits

- i. Thermistor
- ii. Thermocouple

(4marks)