TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING

ECI 2203 MEASUREMENT TECHNOLOGY II

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2HOURS

DATE: Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of 5 questions. Attempt ANY 3.

Do not write on the question paper.

Question ONE

a) What are the different types of temperature scales? (4 Marks)

b) Mention FOUR types of filled system thermometer. (4 Marks)

c) Convert the following temperatures to centigrade:

i) $110^{o}F$

ii) 356K

iii) $533^{o}R$ (6 Marks)

d) What are properties required for liquid used for thermometers? (6 Marks)

Question TWO

a) Discuss with the aid of appropriate diagrams the following laws of thermocouple.

i) Law of Homogenous Materials

ii) Law of Intermediate Material (6 Marks)

b) Discuss using circuit diagram the measurement of temperature using RTD connected to Wheatstone bridge. (8 Marks)

c) List three advantages and disadvantages of temperature measurement used in part (b) above.

(6 Marks)

Question THREE

a) Using a neat diagram explain operation of pressure thermometer (fluid type expansion). (10 Marks)
b) What are advantages and Disadvantages of pressure thermometer (fluid type expansion). (10 Marks)

Question FOUR

a) Define Flow. (2 Marks)
b) Distinguish laminar flow and turbulent flow. (4 Marks)
c) State FOUR distinguishable parts of 'Venturi Meter'. (4 Marks)
d) With an aid of a diagram explain working of a venturi meter. (10 Marks)

Question FIVE

a) Explain the following as related to flow measurements, stating units in each case:
    i) Volumetric flow rate
    ii) Mass flow rate
    iii) Velocity flow rate (6 Marks)
b) Explain the working principle of magnetic flow meter. (6 Marks)
c) State advantages and disadvantages of orifice meter. (6 Marks)
d) Mention two applications of ultrasonic flowmeter. (2 Marks)