



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ARCHITECTURE & BUILT ENVIRONMENT

**UNIVERSITY EXAMINATION FOR:**

DIPLOMA OF ARCHITECTURE

EAR 2203: BUILDING ENVIRONMENTAL SCIENCE I

(THERMAL DESIGN)

SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES: SEPTEMBER 2018**

**TIME: 2HOURS**

**DATE: Pick 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 **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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## **Question One**

Describe and explain how the followings factors affect thermal comfort of a person in a room:

- a) Air temperature; (2.5 marks)
- b) Mean radiant temperature; (2.5 marks)
- c) Air velocity; (2.5 marks)
- d) Relative humidity; (2.5 marks)
- e) Intrinsic clothing; (2.5 marks)
- f) Level of activity; (2.5 marks)
- g) Acclimatization; (2.5 marks)
- h) Body shape and health. (2.5 marks)

## **Question Two**

Identify four types of ventilation associated with buildings and state their advantages and disadvantages (20 marks)

### **Question Three**

Explain how the human body regulates its temperature with regards to heat production and heat loss through:

- a) Radiation; (5 marks)
- b) Conduction; (5 marks)
- c) Convection and; (5 marks)
- d) Evaporation. (5 marks)

### **Question Four**

Identify and explain four factors that affect air flow pattern inside a building. (20 marks)

### **Question Five**

a) Explain with the aid of sketches the following types of external shading used on window openings:

- i. Overhang; (4 marks)
  - ii. Louvred overhang; (4 marks)
  - iii. Lightshelf and ; (4 marks)
  - iv. Vertical fins. (4 marks)
- b) What are the disadvantages of interior window shading? (4 marks)