NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF ARCHITECTURE AND QUANTITY SURVEYING

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURE (HONOURS) DEGREE

PART II – FIRST SEMESTER EXAMINATIONS – DECEMBER 2006
AAR2104 – ENVIRONMENTAL DESIGN I

Instructions *Time: 3 hours*

Answer question 1 and three other questions only
*(**Include relevant sketches**)*

QUESTION 1

a) According to G.Atkinson's classification, the tropical regions of the earth are divided into major climatic zones with subgroups. Describe and explain the principal characteristics of the zones giving the problems they may pose to the design of the building envelope in the respective regions. (15)

b) It is important to classify climates using feasible approaches. Explain why it is important to classify climates giving the applicable feasible approaches? (10)

QUESTION 2

In order to design for a site the climatic data of the region, locality and site should be considered in detail. Briefly describe how climatic elements are measured, recorded and used in the design of buildings for various sites.(17)

Describe the theories behind the origin and movement of the I.T.C.Z, trade and polar winds.(8)

QUESTION 3

a) What is meant by orientation of a building and how can it influence the responsiveness of a building to climate. (5)

b) A site in the urban area is likely to experience deviation from the local climate. What urban characteristics are instrumental in causing deviation from the localized climate? (20)

QUESTION 4

a) What are the factors that influence thermal comfort? (5)

b) Describe the various methods that were used in the search of a comfort scale. Indicate equipment/materials used and limitations of each method. (20)

QUESTION 5

Describe five types of energy conserving principles and environmental design strategies that you have learnt and explain their application to the Tropics. (25)

QUESTION 6

What are the principal functions of ventilation? (5)

In what ways can an architect ensure sufficient ventilation to all parts of a building and at the same time exclude unwanted climate elements such as rain, dust and excessive solar radiation. (20)