



**KISII UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**THIRD YEAR EXAMINATION FOR THE AWARD OF THE DEGREE  
OF BACHELOR OF SCIENCE IN APPLIED AQUATIC SCIENCE**

**FIRST SEMESTER 2022/2023  
(SEPTEMBER - DECEMBER, 2022)**

**ENSC 303: CLIMATOLOGY**

**STREAM: Y3 S1**

**TIME: 2 HOURS**

**DAY:**

**DATE: 00/12/2022**

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***INSTRUCTIONS:***

***1. Do not write anything on this question paper.***

***2. Answer Question ONE (Compulsory) and any other FOUR Questions.***

1. (a) Compare and contrast the notions of weather and climate.  
(5 Marks)
- (b) Compare and contrast the sciences of meteorology and climatology  
(5 Marks)
- (c) Describe the various spatial and temporal scales of climatology.  
(10 marks)
- (d) Discuss the different sub-disciplines within climatology. How are they different from/similar to one another?  
(10 marks)
2. (a) Describe the thermal structure of the atmosphere (5 marks)
- (b) What causes the thermal characteristics associated with each thermal layer of the atmosphere?  
(5 marks)
3. (a) Compare and contrast the maritime effect and continentality by examining the climate of various cities located along the same line of latitude.  
(5 marks)
- (b) Discuss the important characteristics of Earth's orbit (5 marks)

4. (a) Discuss the role of atmospheric circulation in creating and maintaining surface currents in the oceans (4 marks)
- (b) What is geostrophic balance in the oceans and why is it important? (2 marks)
- (c) How are thermohaline currents tied to the atmosphere and how can these currents affect climatic variations in the future? (4 marks)
- 5.(a) Describe the properties of the sublayers in the near-surface part of the troposphere (4 marks)
- (b) What is the difference between mechanical turbulence and thermal turbulence? (3 marks)
- (c) Describe the two convective or turbulent fluxes in the near-surface atmosphere. (3 marks)
6. (a) Which of the surface water balance variables is most indicative of drought? Why? (5 Marks)
- (b) Discuss the primary atmospheric circulation features present on a nonrotating planet with a continuous, uniform surface. (5 Marks)