



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

**FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR SCIENCE IN CLIMATE CHANGE AND
DEVELOPMENT WITH INFORMATION TECHNOLOGY**

MAIN CAMPUS

NCA 104: INTRODUCTION TO CLIMATE CHANGE DYNAMICS

Date: 4th May, 2016

Time: 2.30 - 4.30 pm

INSTRUCTIONS:

- Answer question ONE and any other TWO questions.
- Sketch maps and diagrams should be used whenever appropriate.



NCA 104 : INTRODUCTION TO CLIMATE DYNAMICS

1.(a) Differentiate between the following terminologies ;

- i. Dry and moist adiabatic lapse rates (5marks)
- ii. weather and climate (5 marks)
- iii. Atmospheric stability and atmosphere instability (5marks)

b) The higher you go the cooler it becomes". Discuss this statement (15marks)

2. Describe the components of the climate system (20marks)

3. a) Define the term atmospheric scattering (5marks)

b). Explain why the sky looks blue (5marks)

c).Discuss **ANY TWO** laws of scattering stating any assumptions (10marks)

4. a) Moist air rises adiabatically in environment with dry adiabatic lapse rate of $9.8^{\circ}\text{C}/\text{metre}$ from a height of 950mb. Given that temperatures at layers 1 and 2 are 10°C and -15°C respectively, determine the height at which the cloud will form in such an atmosphere. Assume the cooling rate is constant (15marks)

b) From your calculation above, what would happen to a balloon full of warm air released in such an atmosphere (5marks)

5.a) Explain the anthropogenic causes of imbalance in the Earth System (10 marks)

b) Explain how the Earth adjusts to the above imbalance (10 marks)

6.a) Discuss the different layers of the atmosphere (10marks)

b) Sketch a temperature profile on the same diagram indicating where "inversion layer" occurs (10 marks)