



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2013/2014

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE
DEGREE OF MASTER OF SCIENCE IN ENVIRONMENTAL
SCIENCES
(CITY CAMPUS)

NES 822: EARTH SYSTEMS SCIENCE

Date: 29th November, 2013

Time: 9.00 - 12.00 noon

INSTRUCTIONS:

- **Answer ANY FOUR questions.**
- **Each question is 15 marks.**

NES 822: EARTH SYSTEMS SCIENCE

INSTRUCTION: ANSWER ANY FOUR QUESTION.

1. Explain the nature of earthquake, their measurements and the nature of faulting.
2. Discuss Earth system science analysis of sphere ↔ sphere of a forest fire.
3. The data below is for the approximate preindustrial 1850 and 1985 concentrations of gases in the atmosphere.

Gas	1850	1985	Assumed growth rate (1985—2075)
Co ₂	280 ppm	345 ppm	0.57%
CH ₂	1150 ppb	1790ppb	1%
N ₂ O	285 ppb	305 ppb	0.5%
CFC -- 11	0 ppb	24 ppb	2.5%
CFC -- 12	0 ppb	0.40 ppb	2.5%

Using the assumed growth rates above.

- a) Calculate the combined equilibrium temperature change for 1985.
(7 mks)
 - b) Calculate the equilibrium temperature increase in the year 2075. Assume ΔT is 3° C. (8 marks)
4. Describe the A,C,D and E climate classification categories. (15 marks)
 5. Calculate the tons of carbon in the atmosphere corresponding to a concentration of 360 ppm of CO₂. Assume the total mass of air equals 5.1×10^{18} kg. The density of air standard temperature and pressure (STP, 0°C, and 1 atm) is 1.29 kg/m³. (15 Marks)
 6. Diagram Earth's interior cross section and describe each distinct layer. (15 Marks)