



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2013/2014

**THIRD YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR OF SCIENCE IN EARTH SCIENCES WITH
INFORMATION TECHNOLOGY
(MAIN CAMPUS)**

NGA 308: GROUNDWATER EXPLORATION

Date: 18th July 2014

Time: 11.00 – 1.00 p.m

INSTRUCTIONS:

- Answer Question ONE (1) and any other TWO (2) questions
- Illustrations should be used where appropriate



NGA 308: GROUNDWATER EXPLORATION

1. a) Differentiate between the following terms:
 - i) Apparent resistivity and true resistivity (5 marks)
 - ii) Membrane polarization and electrode polarization (5 marks)
 - iii) Recharge and discharge areas in a groundwater system (5marks)
- b) Explain the importance of step drawdown tests in borehole pumping tests (5marks)
- c) Describe the vertical electrical sounding method of groundwater exploration (10marks)
2. a) Discuss the limitation of Percussion borehole drilling method (10marks)
- b) Explain factors affecting well development processes (10 marks)
3. Discuss the hydrogeological and structural features that are useful during a groundwater investigation in a given basin (20 marks)
4. a) Write short notes on the following;
 - i) Active geophysical survey methods (5 marks)
 - ii) Well logging techniques (5 marks)
- b) Describe and account for the variations in the density and magnetic susceptibility of rocks (10 marks)
5. Discuss the application of remote sensing technique in groundwater investigation (20 marks)
6. a) Explain the term 'data reduction' in gravity and magnetic data processing (8 marks)
- b) Discuss three data reduction procedures in the gravity method (12 marks)