



**MASENO UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2015/2016**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE  
DEGREE OF BACHELOR SCIENCE IN EARTH SCIENCE WITH  
INFORMATION TECHNOLOGY**

**MAIN CAMPUS**

**NGA 104: INTRODUCTION TO PHOTOGRAMMETRY**

Date: 20<sup>th</sup> April, 2016

Time: 2.30 - 4.30 pm

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**INSTRUCTIONS:**

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



## NGA 104: INTRODUCTION TO PHOTOGRAMMETRY

1. (a) Differentiate between the following:
    - (i) Orthogonal and central perspective projections (3 marks)
    - (ii) Nadir line and the airbase (3 marks)
    - (iii) Aberrations and distortions (3 marks)
  - (b) Explain the following operations:
    - (i) Interior orientation (2 marks)
    - (ii) Relative orientation (2 marks)
    - (iii) Absolute orientation (2 marks)
  - (c) Distinguish between the operating principle of a stereo plotter and that of aerial photography (10 marks)
  - (d) Discuss the advantage of photogrammetry over field survey (5 marks)
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2. (a) Discuss the relationship between camera focal length, flying height, scale and Ground coverage (12 marks)
  - (b) Draw a well labeled diagram to illustrate the relationship between ground  
Terrain points, the positive print and the negative film (6 marks)
  - (c) Explain the use of information found in the margins of an aerial photograph (2 marks)
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3. (a) Describe the procedure of careful adjustment for preparing and arranging aerial photographs for stereoscopic viewing (10 marks)
  - (b) Explain the conditions necessary for accurate and comfortable stereoscopic viewing (6 marks)
  - (c) Explain the importance of overlap and endlap in aerial photography (4 marks)

4. (a) Account for distortions inherent in aerial photography (10 marks)
- (b) Explain the significance of using stable base materials for photographic Products (5 marks)
- (c) Distinguish between an aerial photograph and a map (5 marks)
5. (a) Explain the functions of the various component parts of an aerial camera (12 marks)
- (b) Compute the camera angle of view of an aerial photograph given format size 230mm by 230mm and camera focal length lens 152mm (8 marks)
6. (a) Define the term relief displacement (2 marks)
- (b) The distance between the top and bottom of a tower on a vertical aerial photograph was measured as 12mm and from the photo principle point to the base of displaced tower was found to be 35mm. If the scale of the photo is 1:20,000 and the focal length of 152mm. Compute the height of the tower. (8 marks)
- (c) Explain how relief displacement can be corrected and eliminated (6 marks)
- (d) Comment on relief displacement of two points on an aerial photograph, one below and the other above datum (4 marks)