TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR DECREE IN:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING (BSCE)

ECE 2314: SURVEYING IV

END OF SEMESTER EXAMINATION
SERIES: APRIL 2015
TIME ALLOWED: 3 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*
- *Pocket Calculator*

This paper consists of **FIVE** questions. Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
Use neat, large and well labeled diagrams where required
This paper consists of **TWO** printed pages

Question One (Compulsory)

a) Define photogrammetry **(2 marks)**

b) There are at least two approaches to the classification of photogrammetry. Cite at least two approaches and outline the main types of photogrammetry under these approaches **(8 marks)**

c) Define remote sensing and with the aid of a diagram outline the components of a remote sensing system **(6 marks)**

d) State and briefly discuss FOUR types of hydrographic surveys, their purposes and uses **(4 marks)**

e) Using appropriate diagrams, distinguish between vertical and oblique photographs **(6 marks)**

f) Two phimblines A and B in a mining shaft are 8.24m apart. It is required to extend the bearing AB along the tunnel underground. A theodolite can only be set up at C, 19.75m from B and a few

millimeters off the line AB produced. If the angle BCA is 9' 54" compute the offset distance of C from AB produced **(4 marks)**

Question Two

a) Discuss the elements of visual image interpretation **(8 marks)**

b) With the aid of appropriate diagrams, discuss THREE attitude variations of an airborne sensor and their effects on an image. **(6 marks)**

c) Outline THREE modifications to surveying equipment used in underground surveying and the reasons for these modification **(6 marks)**

Question Three

a) Discuss the advantages of Remote Sensing as a mass data collection method **(4 marks)**

b) Discuss echo sounding, outlining its logic, advantages and limitations **(5 marks)**

c) Discuss TWO ways in which Electromagnetic radiation can be modified and relate the two by means of appropriate equations. Explain how this relationship is relevant to Remote sensing **(6 marks)**

Question Four

a) An area of 150km2, which is at datum level, is to be photographed at a scale of 1:10000 using a camera of focal length 152.4mm. The photo format is 23 x 23cm and the fore overlap and overlap are 60% and 25% respectively. Assuming an aircraft speed of 250km/hr. Compute the following:
- **(i)** Flying height
- **(ii)** Time interval between exposines
- **(iii)** Number of photographs if strips are 15km long **(10 marks)**

b) Explain the following terms as used in Remote Sensing **(4 marks)**
- **(i)** Orbit
- **(ii)** Electromagnetic spectrum
- **(iii)** Temporal resolution
- **(iv)** Light

c) Disuse SIX areas of application of hydrographic surveying **(6 marks)**

Question Five

a) Flight planning is essential to any photo-grammetric mission. Explain why and state the factors considered in this process **(7 marks)**

b) Illustrate and discuss the TWO types of Remote Sensing based on energy source **(6 marks)**

c) Colour photographs cannot be created by super imposition of the primary colours. Explain **(3 marks)**

d) Using appropriate examples, explain what you understand by the term "Trade-off" as if applies to photogrammetry and Remote sensing and the Role of a Civil Engineer as a project manager

(4 marks)