FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

BSC IN CIVIL ENGINEERING

ECE 2314 : SURVEYING IV

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: 18 May 2016

Instructions to Candidates
You should have the following for this examination
    -*Answer Booklet, examination pass and student ID*
    -*Drawing instruments.*
This paper consists of **FIVE** questions.
Attempt question ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

QUESTION ONE   [30 Marks]

a)   With the aid of a sketch explain the operation of an aerial camera.

[5 marks]

b)   The function of terrestrial and aerial cameras is taking pictures. However, the requirements of aerial cameras are quite different. Discuss them.

[5 marks]

c)   Explain the role of a shutter and describe the three types of shutters.

[10 marks]

d) Explain the role of the following parts of a camera:
   i.   Diaphragm.
   ii. Magazine.
   iii. Drive mechanism.

   [6 marks]

e) A camera having focal length of 20 cm is used to take a vertical photograph to a terrain having an average elevation of 1400 metres. What is the height above sea level at which an aircraft must fly in order to get the scale of 1:800?

   [4 marks]

QUESTION TWO   [20 Marks]

a) With the aid of a sketch derive a scale of a vertical photograph when:
   i.   The ground is horizontal.
   ii. The ground not having the same elevation.

   [7 marks]

b) Explain the following scales:
   i.   Datum scale.
   ii. Average scale.

   [4 marks]

c) A vertical photograph was taken at an altitude of 1200 metres above sea level; determine the scale of the photograph for terrain lying at elevations of 100 metres and 320 metres if the focal length of the camera is 15 cm.

   [9 marks]

QUESTION THREE   [20 Marks]

a) Explain the term parallax.

   [3 marks]

b) Explain the use and working of parallax bar.

   [5 marks]

c) Explain the principle of stereoscopic depth perception.

   [5 marks]

d) The elevations of three points A, B and C were determined from a contoured map as 1500 m, 1000 m, and 1200 m. If flying height of the aircraft above sea level is

3500 m and the focal length of the camera lens is 160 mm, calculate the average scale of the aerial photograph.

[7 marks]

QUESTION FOUR   **[20 Marks]**

a)   Describe geometric aspects of the task of flight planning.

[4 marks]

b)   What are the different types of overlaps? What is the purpose of providing them in aerial photographs?

[6 marks]

c)   Discuss the data required for computation of flight plan.

[4 marks]

d)   The scale of an aerial photograph is 1 cm = 100 m. the photograph size is 20 cm x 20 cm. determine the number of photographs required to cover an area of 100 square kilometre if the longitudinal lap is 60 per cent and the side lap is 30 per cent.

[6 marks]

QUESTION FIVE   **[20 Marks]**

a)   Describe the characteristics of photographic images.

[4 marks]

b)   Discuss the application of aerial photographic interpretation.

[6 marks]

c)   Discuss briefly an ideal remote sensing system.

[10 marks]