



**TECHNICAL UNIVERSITY OF MOMBASA**

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FACULTY OF ENGINEERING AND TECHNOLOGY  
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:  
INSTITUTION BASED PROGRAMME**

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

**ECE 2314 : ENGINEERING SURVEY IV**

END OF SEMESTER EXAMINATION

**SERIES: AUGUST, 2017**

**TIME: 2 HOURS**

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of five questions.

Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

### QUESTION ONE (Compulsory) 30 Marks

- a). In a pair of overlapping photographs (mean photo base length 89.84 mm) the mean ground level was given as 70 m above the datum. Two nearby points were observed and the following information obtained:

Point	Height above datum	Parallax bar reading
X	55 m	7.34 mm
Y	?	9.46 mm

If the flying height was 2200 m above datum and the focal length of the camera was 150 mm, determine the height of point Y above the datum (Assume a direct reading stereo meter) (6 Marks).

- b). Define hydrographic survey. Why is it important? (8 Marks).
- c). Discuss the importance of the following parts of a camera
- i). Camera lens
  - ii). Camera filter
  - iii). The shutter and diaphragm
  - iv). The focal plane (12 Marks).
- d). Describe the drive mechanism of an aerial camera (4 Marks).

### ANSWER ANY TWO QUESTIONS FROM THIS SECTION

#### QUESTION TWO (20 marks)

- a). A vertical photograph contains images of three ground control points A, B, and C at a, b and c respectively. The elevations of these points and their coordinates measured on the photograph by using a micro rule and corrected for film shrinkage were recorded as follows:

Point	x (in)	y (in)	Elevation (ft)
a	-1.954	-3.502	974
b	- 3.106	+2.250	146
c	+2.155	+2.775	420

Given that the flying of the area was 7810 ft and the focal length of the taking camera was 8.212 in. Determine the lengths of the lines AB, BC and CA (14 Marks).

- b). Discuss the six elements of interior orientation of a camera which aid in calibration process of an aerial camera (6 Marks).

**QUESTION THREE (20 Marks)**

- a). Discuss stages followed in the development of an aerial film **(12 Marks).**
- b). Explain ANY four elements of visual interpretation of an image **(8 Marks).**

**QUESTION FOUR (20 Marks)**

- a). Discuss ANY five applications of Photogrammetry **(10 Marks).**
- b). Explain the depth of perception as applied in Photogrammetry **(4 Marks).**
- c). Discuss three major types of visions as described in stereoscopy **(6 Marks).**

**QUESTION FIVE (20 Marks)**

- a). Explain the conditions that must be fulfilled in order to achieve stereoscopic viewing of photographs **(8 Marks).**
- b). With an aid of a sketch, describe the basic parts of an aerial camera **(12 Marks).**