



TECHNICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
**UNIVERSITY EXAMINATION FOR:  
BACHELOR OF SCIENCE IN CIVIL ENGINEERING  
(BSCE Y3 S2)**

ECE 2314: ENGINEERING SURVEYING IV

**END OF SEMESTER EXAMINATION**

SERIES: APRIL 2014

**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer booklet*

This paper consists of **FIVE** questions.

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

All questions carry equal marks

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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**Question One (COMPULSORY)**

- a) Define the term parallax. **(2 marks)**
- b) What is relief displacement. With an aid of a sketch, show that the equation for relief displacement is given by:

$$d = \frac{rh}{H}$$

where: d = length of the displaced object on the photo

H = Flying height above the datum

r = radial distance from the Principal point to the top of the displaced object

**(8 marks)**

- c) What are the advantages and disadvantages of satellite remote sensing as compared to the other conventional method of data capture. **(6 marks)**
- d) A vertical photograph contains images of three ground points A, B and C at a, b and c respectively. The elevations of these points and their co-ordinates were measured on the photograph with the use of micro rule and corrected for film shrinkage. The data provided was as follows:

Point	x(mm)	y(mm)	Elevation (m)
a	-51.64	-90.95	1000
b	-80.89	+60.15	550
c	+56.52	+72.49	705

The flying height was provided as 900m and the focal length of the taking camera was 152.98mm. determine distance AB, BC and CA in Kilometres. **(14 marks)**

### Question Two

- a) Discuss elements of Visual Interpretation of an image. **(6 marks)**
- b) Explain briefly the importance of hydrographic survey. **(8 marks)**
- c) In a pair of overlapping photographs whose mean base length was 90.22mm and the mean ground level was given as 100 above the datum had two points observed. The details were as follows;

Point	Height above datum	Parallax bar reading
X	55.0	7.21mm
Y	?	9.48mm

If the flying height was 2000m above mean sea level, and the focal length of the taking camera was 152.98mm, determine the height of point Y above the datum. **(6 marks)**

### Question Three

- a) With an aid of a sketch, explain the basic parts of an aerial frame camera that. **(8 marks)**
- b) Discuss stages followed during the development of an aerial film of an aerial frame camera. **(12 marks)**

### Question Four

- a) A vertical photograph was taken from 545m above the datum. The elevation of the base of the tower was 260m and had a relief displacement of 54.5mm. The radial distance to the top of the tower was 122.00m. What was the height of the tower? **(2 marks)**
- b) Explain conditions that must be met so as to achieve stereoscopic viewing of photographs. **(8 marks)**
- c) Discuss various applications of photogrammetry. **(10 marks)**

### **Question Five**

- a) Discuss the double image phenomena. **(6 marks)**
- b) Make short notes on the following elements of flight planning:
- (i) Tilt
  - (ii) Crab and drift
  - (iii) Flying weight
  - (iv) Relief displacement **(12 marks)**
- c) Define the term “Exposure” as used in aerial camera mapping. **(2 marks)**