



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of BUILDING & Civil engineering

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 4425 : ENGINEERING SURVEY - IV

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: NOVEMBER 2024

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 (30 Marks)



a) What are the functions of essential parts of an aerial camera

i). Camera lenses

ii). Shutter and diaphragm

iii). Filters

(7 Marks).

b) Discuss rectification as used in photogrammetry

(6 Marks).

c) Using a sketch show that scale for a vertical photo taken over a variable terrain is given by

$$S = \frac{f}{H-h} \quad \text{where: } S = \text{scale of variable terrain,}$$

f = the focal length of the taking camera,

H = is the Height above the datum

h = point of interest

(7 Marks).

d) In a pair of overlapping photographs (mean photo base length of 90.84 mm), the mean ground 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	7.34 mm
Y	?	90.96 mm

If the flying height was 2300 m above the datum, and the focal length of the taking camera was 152.4 mm, determine the height of point Y above the datum (assume a direct reading stereo meter

(6 Marks).

e). Which factors hinder stereoscopy?

(4 Marks).

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION TWO

- a). Derive the essential equation of the relief displacement (10 Marks).
- b). With an aid of a sketch, describe the depth of perception phenomena (10 Marks).

QUESTION THREE

- a). Differentiate between monocular and binocular vision (4 Marks).
- b). Discuss the characteristics of vertical and oblique photographs (6 Marks).
- c). Discuss different types of platforms for the sensors (4 Marks).
- d). Make short notes under the following parts of an aerial camera
 - i). Lens cone assembly
 - ii). Camera body
 - iii). Camera magazine (6 Marks).

QUESTION FOUR

- a). Explain the following terms
 - i). Camera mounts
 - ii). Camera controls (4 Marks).
- b). Discuss essential elements of interior orientation of a camera (6 Marks).
- c). Explain the four eye defects (8 Marks).
- d). Explain the application of photogrammetry in forestry (2 Marks).

QUESTION FIVE

- a). With an aid of a sketch, explain essential parts of mirror stereoscope (8 Marks).

b). Step by step, explain the development of an aerial film **(12 Marks).**

