University of Zambia
University Examinations- July 2001
SE 332
Photogrammetry I

Time: Three (3) hours
Answer **ALL** questions from section A and only **ONE** from section B

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SECTION A

Question 1

a) Define the following photographic terms:
   - Scale of photograph
   - Photosensitivity
   - F-number
   - Dead area
   - Flying height

b) What are the main technical requirements for planning of aerial photographs?

c) Using a camera with 150 mm focal length and 230 square millimeters format and assuming that the average photobase is 69 mm, the distance between successive strips is 161 mm and photo scale 1: 30 000, calculate the following parameters;

   - End and side overlap of photographs
   - Size of overlapped area at photo scale and in terrain
   - Air base
   - Flying height

(10 + 5 + 10)

Question 2

a) Using a clearly labeled diagram, describe the functions of the main parts of an aerial camera.

b) Discuss the importance of camera calibration and indicate what information relating to the camera forms part of the calibration certificate.

c) What are the major steps involved in processing of black and white film?

(8 + 9 + 8)

Question 3

a) A shutter speed of 1/1000 is desired to obtain a sharp image at f/4.0, what f/number should be used to achieve the same result at a shutter speed of 1/500?

b) With the help of well-labeled diagrams, describe the five (5) major lens aberrations that affect image quality.

c) Explain the main differences between perspective and orthogonal projections.

(8 + 10 + 7)

SECTION B

Question 1

a) Explain the following terms;
- Stereoscopic depth perception
- Stereoscopic model
- Floating mark
- X- parallax

b) The length of line AB and the elevation of its endpoints, A and B, are to be determined from a stereopair containing images a and b. The camera used to take the photographs has a 154.4-mm lens. The flying height was 1200 m (average for two photos) and the air base was 600 m. The measured photographic coordinates of points A and B in the "flight line" coordinate system are x(a) = 54.61 mm, x(b) = 98.67 mm, y(a) = 50.80 mm, y(b) = -25.40 mm, x'(a) = -59.45 mm, and x'(b) = -27.39 mm. Find the length of line AB and the elevations of A and B.

(8 + 17)

Question 2

a) Name the seven basic characteristics of photographic images that are considered in photographic interpretation and give an example of how each may be used to identify a particular object.
b) Derive the parallax equation for determination of a point elevation from x-parallax measured on a pair of vertical photographs.
c) Show with figure and equation how an image point is displaced due to relief of terrain.
d) Compare the advantages and disadvantages of the pocket and mirror stereoscopes

(7 + 7 + 7 + 4)