University of Zambia
School of Engineering
Department of Surveying

May 2000 Examinations
SE 332 – Photogrammetry I

Answer ALL questions from section A and ONLY 3 from Section B
Time Allowed: 3 Hrs

SECTION A

Question 1 (20)

(a) Define the following terms and give their use in photogrammetric applications;
1. Intervalometer
2. Electromagnetic spectrum
3. Spectral signature
4. Diapositive
5. Photographic material

(b) Given a photogrammetric project covering a rectangular area measuring 50 x 35 Km and that the client desires a mapping scale of 1:5000 by means of a stereoplotter with photo/model ratio of 1:1, calculate the flying height of the aircraft above datum and above ground if the terrain is flat at an altitude of 1260m using a 15/23 camera.

Question 2 (20)

(a) What is meant by the term camera calibration? Give any one detailed method used for calibration in a laboratory environment.
(b) Give at least five of the interior orientation parameters determined during the camera calibration process?

SECTION B

Question 1 (20)

(a) What are the major systematic errors that are corrected during refinement of coordinates?

(b) Derive from first principles the formula for calculating the distortions due to relief displacement of vertical photographs

Question 2 (20)

A project area is 16Km in East-West and 10.4 Km in North-South. The project area is to be mapped by photogrammetric techniques at a scale of 1:12000. The end and side lap for the project is 60% and 30% respectively using a 15/23 camera. Calculate the following parameters.

(a) Dimensions of the square ground coverage
(b) Distance between two successive strip
(c) Number of flight lines
(d) The air base
(e) Total number of photos required to cover the project area

Question 3 (20)

(a) Using a well-labelled diagram, explain what is meant by optical and differential rectification? Give examples in which the two methods are applied.

(b) In making photo controls, artificial targets are used in practice. However, such targets have disadvantages when used. Clearly describe the two main disadvantages

(c) Give the three main methods used in the establishment of ground control points in photogrammetric mapping.

Question 4 (20)

(a) Describe the five main ways in which electromagnetic radiation is propagated during interaction with earth objects.

(b) Name the seven main direct and indirect characteristics used in photo interpretation

(c) Give the main advantages of colour infrared photographs. State the applications where CIR photographs are highly suitable compared to Black and White photographs.

End of exam
Good Luck!!!!!!!!