

Name: \_\_\_\_\_

FO-4313/6313 Spatial Technologies in Natural Resource Management  
**Second Hour Exam, 2005**

1. Explain the differences/similarities between latitudes/longitudes, UTM's, and the G.L.O. survey system: (6)

Latitudes/Longitudes: \_\_\_\_\_

\_\_\_\_\_

UTM Coordinates: \_\_\_\_\_

\_\_\_\_\_

G.L.O. survey system: \_\_\_\_\_

\_\_\_\_\_

2. You are planning to contract for stereo coverage (60% endlap) photography at a scale of 1:16,000 of an area with an average elevation of 280 ft.. If the contractor has an airplane that cruises at 160 knots per hour and an aerial camera with a 152.4mm focal length that uses a 9 by 9 inch film format, your calculations show:

a. The acreage covered by one photo is \_\_\_\_\_ acres. (10)

b. In order to obtain 60% **endlap**, the distance between photo centers (on each flight line) should be \_\_\_\_\_ ft. (5)

c. In order to obtain a 20% photo (safety) **overhang** outside the target area boundary, the first and last flight lines should be located \_\_\_\_\_ ft. inside the area boundary. (5)

d. In order to obtain a 25% **sidelap**, interior flight lines (except for first and last) should be spaced a maximum of \_\_\_\_\_ ft. apart. (5)

3. GPS computes the location coordinates, x, y, and z; name a coordinate of each:

X = \_\_\_\_\_,

Y = \_\_\_\_\_, and

Z = \_\_\_\_\_ (6)

4. Explain why you can/cannot digitize timber type lines directly from an aerial image into a GIS if it:

a. has **not** been ortho rectified: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ (5)

b. has been ortho rectified: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ (5)

5. The UTM coordinate system is an artificial rectangular grid from a transverse mercator projection of a 6 degree slice of longitude.

a. It is an “**artificial**” rectangular grid because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_. (5)

b. the UTM coordinate for X is called/named \_\_\_\_\_ and

the UTM coordinate for Y is called/named \_\_\_\_\_ (6)

6. The UTM coordinates for a parcel of land are:

X	Y
325,575	3,689,231
332,575	3,689,231
325,575	3,685,231
332,575	3,685,231
337,575	3,685,231

a. Draw/sketch the shape of the land parcel: (5)

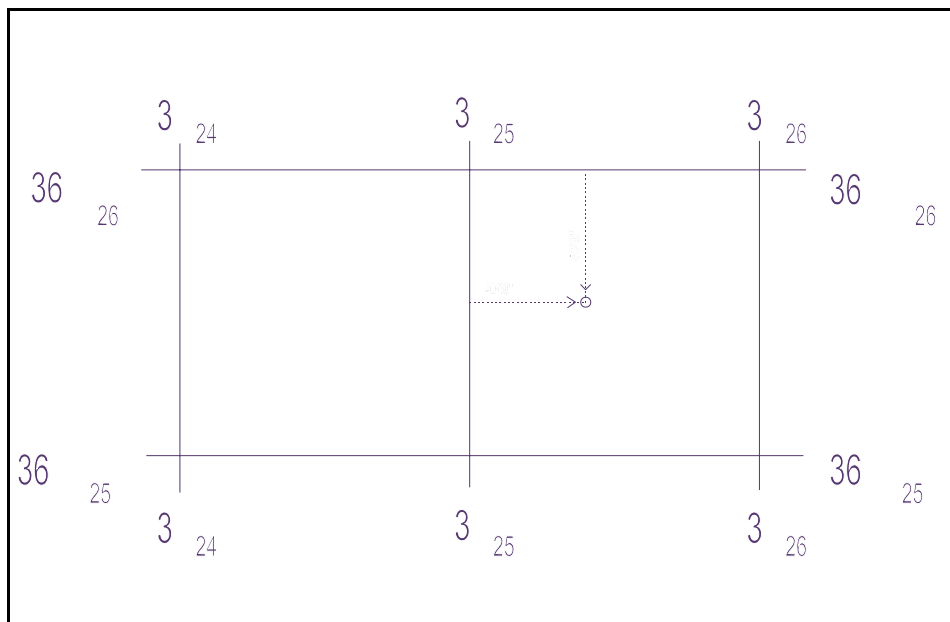
b. The parcel contains \_\_\_\_\_ hectares or \_\_\_\_\_ acres. (6)

c. The eastern boundary of the parcel has a bearing of: \_\_\_\_\_ (5)

7. Refer to the sketch from a **7.5 minute quadrangle** below where the scale is **1:24,000**. If the measured distances are  $X=+40/60$  inch from the  $3_{25}$  grid line and  $-50/60$  inch from the  $36_{26}$  UTM grid lines to Control Point X, calculate the UTM coordinates of Control Point X. (give distance, unit of measure, direction)

a. X coordinate = \_\_\_\_\_ (3)

b. Y coordinate = \_\_\_\_\_ (3)



8. Refer to the portion of the Bradley 7.5 minute quadrangle below. Calculate the latitude/longitude coordinates of point X. All appropriate numbers and scales are visible on the copied portion of the quad sheet.

The coordinates for Point X are:

Latitude: \_\_\_\_\_ (10)

Longitude: \_\_\_\_\_ (10)

