

I. **True/False:** circle the correct response, 1pt each:

- T F 1) The human eye can separate 100 times more gray scale values than it can color combination.
- T F 2) Color infrared photography exposed through a wratten 12 (yellow) filter images objects in their natural color.
- T F 3) The reason we perceive the stereomodel to be exaggerated in the 3rd- dimension is that a hyperstereoscopic condition is present due to our normal interpupillary distance of about 2.2" being, in effect, stretched to the distance between exposure stations along the flight line of the airplane.
- T F 4) Thermal image scanners produce a picture totally made up of detected heat with no visible light content.
- T F 5) In the electro-magnetic spectrum, frequency is inversely related to the wavelength.
- T F 6) The ratio of the camera focal length to the film speed is known as "F/Stop"
- T F 7) RF (representative fraction) is a representative of scale.
- T F 8) The scale of an aerial photograph can be generally determined by dividing the photographic distance between two points, by the ground distance between the same two points.
- T F 9) Human vision is sensitive to the near-infrared.
- T F 10) The Spot satellite contains a sensor with a 10 X10 meter spatial resolution.

II. **Multiple Choice**, Circle the correct answer, 1pt each:

- 1) Who created the application we associate with RADAR?
 - A Dr. Hans E. Hollmann
 - B Gunther Erbsloeh
 - C Hans-Karl von Willisen
 - D All of the above

- 2) Which of the following is **not** a means of energy transfer:
 - A convection
 - B radiation
 - C convection
 - D evaporation

- 3) Atmospheric scattering that makes the sky appear blue is called:
 - A Mie
 - B Distorting
 - C Rayleigh
 - D Non-selective

- 4) Which of the following is the largest scale?
 - A 1:5,000
 - B 1:100,000
 - C 1:2,400
 - D 1:63,360

- 5) The instrument that times the photo sequence with the speed of the airplane is called:
 - A shutter timer
 - B speedometer
 - C intervalometer
 - D odometer

- 6) Processing infrared film produces which type of print:
 - A false color
 - B disinformed color
 - C true color
 - D living color

- 7) The best band for completing geological remote sensing would be the
- A blue
 - B red
 - C Near infrared
 - D Mid Infrared
- 8) The first aerial photograph taken from an airplane is credited to:
- A L. P. Bonvillian
 - B Daguerre
 - C Tournachon
 - D The Wright Brothers
- 9) The first aerial photograph taken from a hot air balloon is credited to:
- A Dr. Bozer
 - B Herschel
 - C Nadar
 - D Daguerre
- 10) The satellite that has the highest spatial resolution is,
- A Spot
 - B Landsat MSS
 - C AVHRR
 - D Landsat TM
- 11) The best satellite for isolating chlorophyll absorption would be:
- A Spot
 - B Landsat Mss
 - C GOES
 - D Landsat TM
- 12) The best example of a geosynchronous orbit satellite is:
- A Spot
 - B Landsat MSS
 - C GOES
 - D Landsat TM

III. **Short Answer:** Briefly answer each of the following questions.

1) CCD is a semiconductor that stores and transfers electronic signals and is used in every form of Digital Camera today. What does CCD stand for? 1pt

2) In remote sensing white is perceived when? 1pt

3) LIDAR is an acronym for what? 1pt

4) Explain the difference between a specular reflectance and a lambertian reflectance? A diagram would easily show this. 2 pts

5) What are atmospheric windows? 2pts

6) Name the seven (7) bands on the Landsat TM satellite and briefly describe what each band is best suited for. 14 pts

7) Name four of the factors that are assessed when trying to identify a feature during photo interpretation: 4 pts

8) A plane flying at 12,000 feet has two cameras, both cameras have the same focal length, one camera uses a 35 mm film size and the other uses a 240 mm film size. How would this affect the ground area recorded by the camera? A diagram would help. 2pts

9) Diagram the additive and subtractive color primaries. 2pts

10) On a Landsat TM image, what would be the best **3 band** combination to study vegetation and why? 2pts

11) What are the four types of resolution that affect all remote sensor systems. Write a brief definition of each. 8pts

a)

b)

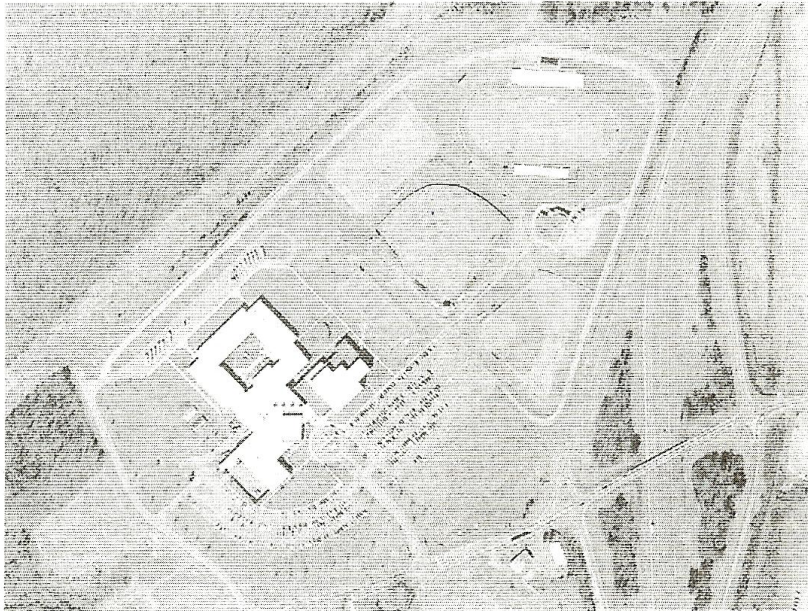
c)

d)

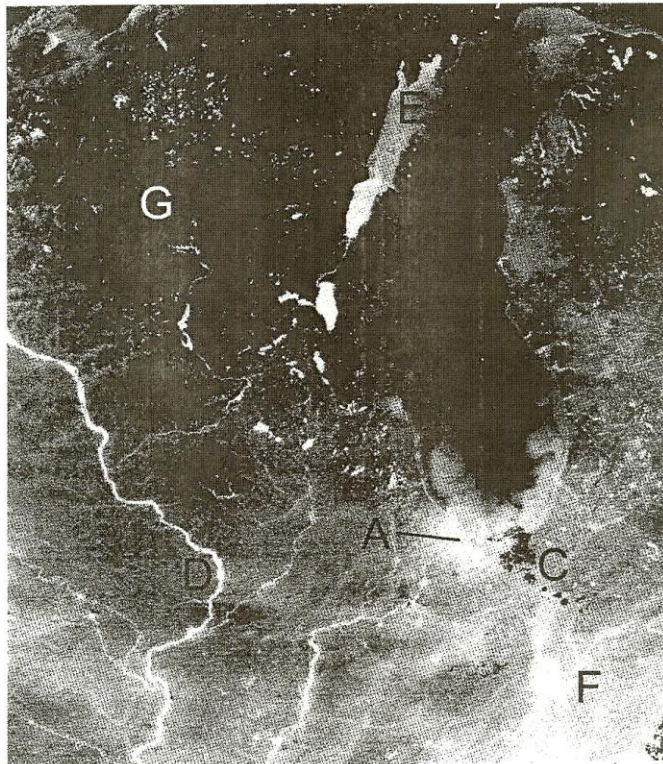
- 5) A smokestack appears in a photo taken at a flying height of 8,000 feet. The distance from the nadir to the top of the stack is 1.95 inches and the displacement of the stack is 0.15 inches. What is the height of the stack? 2pts

V. Imagery

- 1) Using your interpretive knowledge, describe what the area is in the photo below. 1pt



Lake Michigan



A thermal image of the area around Lake Michigan is shown above. Use it to answer the pertaining questions. (Image Source: NASA).

1. This image was taken in June of 1979 by satellites as part of the Heat Capacity Mapping Mission (HCMM). Is this a nighttime or daytime thermal image? 1pt

2. Is Green Bay (E) warmer or cooler than the main body of Lake Michigan?

List a possible reason why this might be true. 1pt

a.

3. What do the letters A and B refer to _____ & _____? 2pts

a. Why do you think they are warmer than the surrounding areas? 1pt

b. What is the name given this phenomenon? 1pt

What do you think the black spots near letter "C" are? 1pt

Explain why the areas around letters "G" and "F" have such different temperatures (hint: it has little to do with how far south F is in comparison to G. 2pts

Greensboro

$$RF = \frac{1}{X} = \frac{\text{Distance measured on map or photo}}{\text{Distance measured on the ground}}$$

1. Below is a section of the Greensboro 7.5 minute Quadrangle. What is the length (in feet) of the largest building at the Four Seasons Mall Complex? Use $RF = 1:24,000$ and **show your work**. 2pts

