

Example / Study Questions for Exam 1

The following questions are from a recent exam and should give you a good idea of the nature and format of questions, as well as a good sample of the concepts that will be covered on the exam. Note, however, that the exam will have new and different questions, so preparation for it should be more than finding the answers to these particular questions. But, many of the questions will be related to these questions, so likely good to be familiar with the points in them.

1. Which of the following are advantages of aerial photography?
 - a. improved vantage point
 - b. enhanced spectral sensitivity
 - c. capability to 'stop action'
 - d. permanent record
 - e. all of the above

2. Variations in electromagnetic fields that can be used to identify earth surface features are:
 - a. area and height
 - b. x-rays, ultraviolet, and radiowaves
 - c. spectral, spatial and temporal
 - d. none of the above

3. Reflectance:
 - a. is the ratio of radiance to irradiance
 - b. equals incident - (absorbed + transmitted) energy
 - c. involves wavelengths from about 0.4 to 2.5 μm
 - d. is a fundamental property of the object surface
 - e. all of the above

4. Radiance is:
 - a. a function of the surface reflectance
 - b. affected by the level of irradiance
 - c. affected by atmospheric scattering and absorption
 - d. detected and recorded by photographic film
 - e. all of the above

5. Which parameter would you prefer to measure to best identify and characterize land surface cover types using remote sensing?
 - a. irradiance
 - b. radiance
 - c. reflectance
 - d. transmittance
 - e. absorption

6. Which of the following parameters do sensors respond to (i.e., detect and record)?
 - a. irradiance
 - b. radiance
 - c. reflectance
 - d. transmittance
 - e. absorption

7. In a photographic remote sensing system the energy source is
 - a. photochemical energy in the film
 - b. the sun
 - c. the airplane's electrical power system
 - d. the camera's battery
 - e. all of the above

8. Soils with high organic matter will have (a) darker or (b) lighter tone on panchromatic photographs than low organic matter soils.

9. The near infrared reflectance of vegetation
 - a. is not affected by the amount of leaf area (number of layers of leaves)
 - b. decreases as leaf area increases
 - c. increases as leaf area increases
 - d. cannot be sensed by photographic methods

10. When healthy (green) vegetation becomes stressed or senesces
 - a. its red reflectance increases, its near infrared reflectance decreases, and the color on color IR film will change from red to cyan or green
 - b. its red reflectance decreases, its near infrared reflectance increases, and the color on color IR film will change from green to red or magenta
 - c. neither a or b; color IR film is not sensitive to differences in vegetation condition

11. Remotely sensed near infrared radiance is solar radiation _____ by the surface of the earth.
12. Whereas, remotely sensed far infrared radiance is radiation _____ by the earth.
 - a. absorbed
 - b. transmitted
 - c. reflected
 - d. emitted

13. Microwave energy _____
 - a. ranges from about 1 mm to 1 m in wavelength
 - b. is scattered and absorbed by the atmosphere
 - c. is produced by a radar system
 - d. a and b
 - e. a and c

14. Light
 - a. behaves simultaneously as discrete particles and continuous waves
 - b. consists of an electric and a magnetic field
 - c. has a *variable* speed of wavelength x frequency
 - d. a and b
 - e. a, b and c

15. The amount of radiance received by a sensor depends on
 - a. the sun angle
 - b. the amount of atmospheric absorption and scattering
 - c. the surface reflectance
 - d. all of the above
 - e. only b and c

16. Film exposure is determined by
 - a. focal length
 - b. exposure time
 - c. aperture
 - d. scene brightness
 - e. all of the above

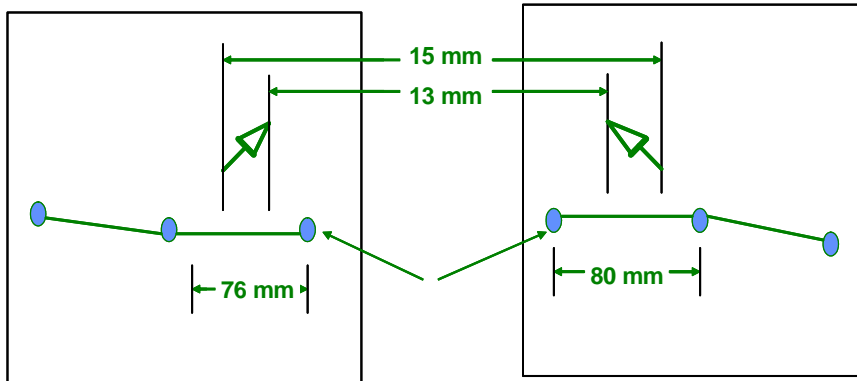
17. Film characteristic curves express the relationship between
 - a. wavelength and transmittance
 - b. scene brightness and film exposure
 - c. log exposure and density
 - d. reflectance and irradiance

18. Color film includes a _____ filter.
 - a. yellow
 - b. blue
 - c. antivignetting
 - d. neither a, b or c. It does not include any kind of filter.

19. A major advantage of infrared film is its ability to sense and record variation in surface temperature.
 - a. true
 - b. false
20. Antivignetting filters are used to
 - a. penetrate haze
 - b. correct for chromatic aberrations
 - c. sense infrared radiation
 - d. equalize the distribution of brightness across the photograph
21. The number of gray and color variations that the human eye can distinguish is
 - a. 50 to 60 gray tones and a few more colors
 - b. about 1,000 gray tones and 10,000 colors
 - c. less than 100 gray tones and thousands of colors
 - d. approximately 1,000 of each
22. "Line pairs per mm" is a measure of
 - a. radiometric resolution of film
 - b. spatial resolution of film
 - c. ground resolution of aerial photography
 - d. image motion
23. Compared to digital imaging systems and data storage, photographic film
 - a. is an extremely efficient data storage medium (e.g., a typical color IR photo might contain approximately 1.5 gigabytes of data or the equivalent of three CD's)
 - b. is capable of recording information from many more spectral bands
 - c. has limited spatial resolution
24. For a perfectly vertical photo, which of the following are at the geometric center of the photo?
 - a. fiducial marks
 - b. principal point
 - c. photographic nadir
 - d. isocenter
 - e. b, c and d
25. Vertical photography is defined as a photo
 - a. taken with no more than 3 degrees tilt
 - b. showing only the ground in the photo
 - c. taken with at least 3 degrees tilt
 - d. showing the horizon in the photo
26. Stereo coverage of an object requires photographs that are
 - a. identical
 - b. taken from different perspectives
 - c. taken with two different film types
 - d. taken with different focal length lenses
27. Fiducial marks
 - a. are used to interpolate film density from photo to photo
 - b. are permanent reference points built into metric cameras that are recorded on aerial photographs and are used to determine the principal point
 - c. are used to draw the flight line on aerial photographs
 - d. a and b
28. The conjugate principal point of an aerial photo is
 - a. a point half the distance from principal point to the edge of the photo
 - b. the corresponding point to principal point of an adjacent overlapping photo
 - c. the point of highest elevation in the photo
 - d. at the optical center of the photo

29. The projection of an aerial photograph is
a. orthographic b. central or perspective c. Universal Transverse Mercator
d. all of the above
30. The scale (representative fraction) of a photo is
a. focal length / altitude above terrain
b. photo distance / ground distance
c. focal length x altitude above terrain
d. ground distance / focal length
e. a and b
31. What is the scale of a photograph taken by a camera with a 100-mm lens at a flying height of 2,584 meters above sea level over level terrain with an elevation of 1,000 meters?
a. 1:25,840 b. 1:2,584 c. 1:15,840 d. 1:1,584
32. On an aerial photograph the distance between two road intersections is 3 inches. A field crew measured the same distance on the ground as 1/2-mile. What is the scale or representative fraction of the photo?
a. 1:7,920 b. 1:15,840 c. 1:10,560 d. 1:31,680
33. The scale of an aerial photograph is 1:12,000. The length of a stream was measured as 4 inches on the photograph. What is the length of the stream on the ground?
a. 3,000 feet b. 3,600 feet c. 4,000 feet d. 4,800 feet e. none of the above
34. A vertical aerial photo of an area with varying elevation will exhibit
a. varied scale across the photo
b. constant scale across the photo
c. relief displacement
d. tilt displacement
e. a and c
35. Relief displacement
a. varies directly with the radial distance from nadir of an object
b. varies with the height of an object
c. can be used to determine heights of objects from single photos
d. a and c
e. a, b and c
36. A projection stereoplotter is used to
a. map the aircraft flightlines flown during an aerial photo mission
b. measure the distances between photo principal points
c. reproduce the geometric orientation of the cameras to each other and to the ground when stereo photos were taken
d. generate topographic maps
e. c and d
37. Orthophotographs are:
a. excellent for mapping topographic elevation because they contain spatial detail not present on most topographic maps
b. photo reproductions corrected for relief and tilt displacements
c. planimetrically correct and can be used to accurately measure area and distance
d. b and c
e. a, b and c

38-39. Given the following measurements from a stereo pair of photos, what is the height of the tree?
The flying height of the aircraft was 5,000 feet.



- a. 1000 feet b. 125 feet c. 100 feet d. 400 feet

40. National Aerial Photography Program (NAPP) 9-inch photos are:

- a. color IR, 1:40,000 scale
b. B & W IR, 1:15,840 scale
c. color IR, 1:58,000 scale
d. color, 1:24,000 scale

41. A major advantage of NAPP photos is that it takes only two photos to have stereo coverage of a 7.5 minute USGS topographic map.

- a. true b. false

42. In preparing to delineate and map land cover from aerial photography, important considerations include:

- a. spectral resolution of the photography
b. definition of the classification system
c. selection of the minimum mapping unit
d. b and c
e. a, b and c

43. When interpreting and mapping from stereo photography, an important first step is to delineate the effective area of the photos because

- a. the effective area includes all areas closer to the center of a photo than to the center of any other photo, and is therefore the area within which objects can be viewed with the least relief displacement.
b. interpretation within the effective area eliminates possible duplicate interpretation from adjoining photos
c. a and b
d. neither a or b. The area of each photo is the same.

44. In aerial photo interpretation, detection, recognition and identification are synonymous terms and can be accomplished with equal confidence and accuracy by skilled interpreters

- a. true b. false

45. The Minnesota Dept. of Natural Resources is acquiring nine-inch color infrared photography
- a. because it costs less than black and white photography
 - b. at a scale of 8 inches per mile
 - c. at 3-year intervals
 - d. in the fall
 - e. all of the above
46. Advantages (relative to nine-inch photography) of small format aerial photography include
- a. larger scale
 - b. greater geographic coverage
 - c. ease of making detailed and accurate measurements of area and distance
 - d. economy and potential to quickly organize and fly a mission
 - e. all of the above

What would be the typical color response you would expect the following cover types to have on color IR film ? The responses are:

- a. cyan b. red to magenta c. black d. blue e. white

- 47. healthy vegetation
- 48. stressed vegetation
- 49. clear water
- 50. silty water