BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (RAJ.)

CEF431   Principles of Geographic Information System   Time:1400-1530Hrs

Date: 7.10.2016   Mid Semester Examination (**A**)   MM:100

(Don't copy questions on answer sheet; Don't write anything on question paper; Write A, B, C, D on top right of answer sheet as mentioned in your question paper;)

Q.1 Select the appropriate alternatives: (1*15)

1. Which of the following effect do NOT result in geometrical errors/distortion in satellite images?
   a) Earth curvature b) Earth rotation   c) Atmospheric absorption d) Sensor platform motion
2. Which wavelength can be most useful for imaging from a satellite in cloud-covered conditions?
   a) 0.4 µm   b)0.4 nm   c)1.4 µm   d)4 cm
3. To compare, overlay or cross analyze two maps in a GIS
   a)   Both maps must be in digital form   (b) Both maps must be in the same map projection
   (c) Both maps must be at the same equivalent scale   (d) all of them
4. The largest scale of the following is
   a) 1:24000   b) 1:62500   c) 1:100000   d) 1:500000
5. Which portion of the EM SPECTRUM would provide the most pertinent data for studying effects of drought on vegetation
   a)   Thermal infrared b) Middle infrared   c) near infrared   d) red spectrum
6. Which is a fundamental task in image processing used to match two or more pictures?
   a) registration   b) segmentation   c) computer vision   d) image differencing
7. Which one of the following does not affect the scale of the air photographs
   a) Ground elevation   b) focal length   c) flying height   d) None of these
8. In standard FCC which wavelength is passed through blue gun:
   a)   red   b) green   c) blue   d)None
9. Ratio of total solar radiant energy returned by a planetary body to the total radiant energy incident on the body is called:
   a)   Reflectance   b) reflectance factor   c) albedo   d) None of these
10. An orthographic projection of a terrain is :
    a)   Image   b) Photograph   c)Map   d) None of the above
11. Which form of representation does a paper map use?
    a) analog   b) digital   c) binary   d) decimal
12. In the world of GIS, another term for the property of connectivity is:
    a)   Proximity   b)neighborhood   c)topology   d) Boolean identity
13. Given a set of elevation sample points of a particular area, the technique that could be used to generate an elevation surface for the same area is:
    a) Interpolation   b) Projection c) Reclassification d) Overlay
14. A Silver polygon is :
    a)   a kind of smart polygon   (b) a kind of specific polygon
    b)   a kind of digitization error   (d) a kind of dynamic polygon
15. What determines the range resolution in radar?
    a) The radiated power   b) The duration of the transmitted pulse   c) The antenna size
    d) The length of the synthetic aperture

Q.2 State whether the statement is true or false with reason: (1.5*20)
(No marks will be awarded if appropriate reason is not given)

1. The partial radiation due to scattered/diffused radiation entering the field of view of a remote sensor other than that from the required target increases the contrast of the image but reduces the sharpness.
2. Spatial resolution is the largest discernible detail in an image.
3. Systems operating at long wavelengths must view large areas of earth at any time.
4. Photos taken with shorter focal length lenses have shorter areas of coverage than do those taken with longer focal length lenses.
5. Radiant temperature will increase with the increase in the kinetic temperature of a blackbody.
6. Thermal radiometer is an imaging device.
7. Sky appears orange and red at sunrise and sunset instead of blue.
8. Metals that are especially shiny or have polished surfaces have low emissivity.

9. Dry bare soil always manifests the peak and valley in reflectance curve.
10. Diffuse reflectors reflect almost uniformly in all directions.
11. An advantage of raster data storage is the smaller amount of data to be stored.
12. Supervised classification does not need training data
13. Atmospheric window helps to identify the objects on the earth surface.
14. A reduction of nitrogen nutrient in plant increases the visible reflectivity.
15. Sensing that uses heat or temperature to detect is called microwave sensing.
16. Without geo-rectifying the image, could you measure the distance between 2 points.
17. You need 2 coordinates for geo-rectifying the image.
18. Shapes files are termed for vector files in GIS.
19. The attribute table cannot be used for analysing the data.
20. State the Stefan's Law. (reason=application)

Q.3 Give the reasons/answer the following statements: (1.5*10+2)
1. A building has high signal strength in SLAR than a water body, although moisture content provides high signal strength.
2. Spatial resolution of a sensor is expressed as the dimension of side of a square not a rectangle dimension.
3. Hyper-spectral remote sensing is based on continuous spectral channels whereas multi spectral is based on discrete spectral channels.
4. Contours can be generated by using interpolation.
5. Overlay is used to find the optimum solution for two or more raster
6. Changing radiometric resolutions affect image interpretation.
7. Blue band is not present in the latest satellite missions of IRS series.
8. What is spectral reflectance curve and what are its utilities in remote sensing?
9. Discuss on the spectral reflectance characteristics of water and vegetation in different spectral bands
10. Explain grid based and feature based GIS.
11. Find the intersection and union of:
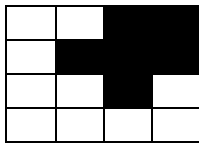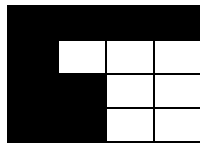
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Q.4. Match the following(10):

a. Point, line and polygon	Spaghetti
b. digitization	Overlay
c. Orthographic Center	Vector file
d. Raster manipulation	Clip
e. Image splitting	Aerial photograph

Q 5. Fill in the blanks: (15*1.5)
1. 1 mm to 1 m is the _____ portion of the EM spectrum.
2. The longer the wavelength involved, the _____ is its energy content.
3. _____ is one of the primary reason of haze in imagery.
4. A small IFOV is desirable for high _____ detail.
5. _____ is a measure of the response of a material to temperature changes.
6. The points which indicates no radiant temperature difference between two materials are called _____.
7. The ground resolution cell size of a SLAR system is controlled by _____ and _____.
8. The angle between the incident radar beam at the ground and the normal to the ground surface at the point of incidence is called the _____.
9. Measurements like area and length of features require a _____ coordinate system.
10. Any feature identified by its cell value is called a _____ feature.
11. Various tools are integrated by the development of a _____.
12. Information from a set of classified raster having certain weightage is obtained by _____.
13. The shape files are created in ....
14. The vectors files of Arc GIS have main extension as ....
15. Arc Map is used for .... the data