Time: 1.5 hrs   Max. Marks: 50

Note: Attempt all questions.

Section-I (50 x 1 = 50 Marks)

1.   It is easy to integrate GIS, Remote Sensing and GPS technologies because these are:
     (a) Digital, special and generic
     (b) Digital, analogue and manual
     (c) **Digital, spatial and generic**
     (d) Negative, positive and neutral

2.   Remote Sensing is unique because it provides:
     (a) **Synoptic view**
     (b) Special information
     (c) Superior information
     (d) Encrypted information

3.   Which of the following is an area of Remote Sensing application?
     (a) Dispatch of emergency medical services
     (b) Egg Production
     (c) Mapping and water resources
     (d) Census

4.   The purpose of georeferencing is to:
     (a) Converting data to a feature class
     (b) Projecting your data so that it has no distortion
     (c) Assigning geographic location information
     (d) Combining two data set

5.   A cell with 1m spatial resolution covers an area of $1m^2$, whereas a pixel with 0.1m spatial resolution covers an area of:
     (a) $0.1m^2$
     (b) $0.001m^2$
     (c) $10cm^2$
     (d) $100cm^2$

6.   Resampling of a raster image:
     (a) Increases the accuracy
     (b) Increases the precision
     (c) Decreases data details
     (d) Increases data details

7.   A 1:50,000 scale map can be compared to the following spatial resolution:
     (a) 50000m
     (b) 50m
     (c) 1/50000m
     (d) Not possible to compare

8. In geographic coordinate system 1° at equator is equivalent to:

    (a) 43.49km
    (b) 78.71km
    (c) 111.32km
    (d) 102.47km

9. Image can have only ……….….integer pixel values, whereas grid can have
    ………….…. and ……….….real and ….….……..cell values.
    (a) **Positive, Positive, Negative, Integer**
    (b) Negative, Negative, Positive, Integer
    (c) Positive, Negative, Negative, Integer
    (d) Negative, Positive, Positive, Real

10. The part radiation due to scattered/diffused radiation entering the field of view of a remote sensor other than that from the required target:
    (a) Increases the contrast of the image but reduces the sharpness
    (b) Reduces the contrast of the image and also its sharpness
    (c) Increases both the contrast and sharpness
    (d) Reduces the contrast but increases the sharpness

11. There are two Survey of India 1:50,000 toposheets with 15' X 15' angular coverage, one from Jammu and another from Kerala. Which of the following statement is true?
    (a) Both the toposheets will cover exactly same size of area
    (b) The toposheet from Jammu will cover a larger area than that of the Kerala
    (c) The toposheet from Kerala will cover a larger area than that of the Jammu
    (d) Projection will affect the size of area coverage

12. GIS, Remote Sensing and GPS technologies are:
    (a) Generic, digital and spatial
    (b) Manual, spatial and digital
    (c) Analogue, manual and spatial
    (d) Generic, analogue and spatial

13. If 0 is the angle of scan measured from the nadir, the ground distance swept by the sensor IFOV is proportional to:
    (a) $\sin 2\theta$
    (b) $\cos 2\theta$
    (c) $\tan 2\theta$
    (d) $\sec 2\theta$

14. GPS measurement is accurate to within 25 meters (95% confidence). This means that you can be 95% sure that your measurement is somewhere within a … meter error circle and there is a 5% chance that the error is LARGER than … meters.
    (a) 2.5
    (b) 5
    (c) 25
    (d) 50

15. Apart from location, GPS data can also be used for:
    (a) Precise timing
    (b) Frequency calibration
    (c) Both (a) and (b)

(d) None of the above

16. Pick up the correct statement from the following:
    (a) Indian space effort started in 1962 with the establishment of a rocket.
    (b) Development of space (DOS) was established by the Government of India in 1972
    (c) Indian Space Research Organisation (ISRO) is responsible for the space technology and its application to various activities.
    (d) All of these

17. A perfectly black body:
    (a) Is a diffuse emitter
    (b) Absorbs all the radiations of every wave lengths
    (c) Emits power of every wave length
    (d) All the above

18. The shape of a pixel of an image can only be:
    (a) Rectangular
    (b) Circular
    (c) Square
    (d) Triangle

19. Overall shape of an image can only be:
    (a) Rectangular and square
    (b) Circular and triangular
    (c) Square and circular
    (d) Triangle and rectangular

20. A and B are two towers of equal height diametrically opposite on either side of the nadir point, at 3 km and 5 km distances. Which one of the following statements is correct?
    (a) Height displacement of A will be less than that of B
    (b) Height displacement of B will be less than that of A
    (c) Height displacement of A and B is equal
    (d) Height displacement of A and B will be towards each other

21. Vegetation with more chlorophyll will reflect more:
    (a) Ultraviolet energy
    (b) Emitted energy
    (c) Near-infrared
    (d) Thermal infrared

22. The interaction of the electromagnetic radiation produced with a specific wave length to illuminate a target on the terrain for studying its scattered radiance, is called:
    (a) passive remote sensing
    (b) active remote sensing
    (c) neutral remote sensing
    (d) None of these

23. Repetitive observations of the same area at equal interval of time, are useful to monitor the dynamic phenomena:
(a) Lithology
(b) Vegetative cover
(c) Buildings
(d) Groundwater

24. Consider the following statements regarding the satellite imaging:
1. The satellite orbit is fixed in the inertial space
2. During successive across-track imaging, the earth rotates beneath the sensor
3. The satellite images a skewed area
Which one of the following is correct regarding the above statements?
(a) 1, 2, 3
(b) 1, 3
(c) 2, 3
(d) 1, 2

25. The altitudinal distance of a geostationary satellite from the earth is about:
(a) 26, 000 km
(b) 30, 000 km
(c) 36, 000 km
(d) 44, 000 km

26. A passive sensor uses:
(a) Sun as the source of energy
(b) Flash light as a source of energy
(c) Its own source of energy
(d) None of these

27. Who coined the term, 'Remote sensing'.
(a) Evelyn L. Pruitt, a geographer
(b) Gaspard Felix Tournachon, a French scientist
(c) Wilbur Wright, an Italian scientist
(d) Albert Einstein

28. Which one of the following geometric errors of satellite sensors is random?
(a) Scan skew
(b) Panoramic distortion
(c) Earth rotation
(d) Altitude variation

29. What is meant by the term 'spatial filtering' in remote sensing?
(a) Changing the position of pixels in an image because of inconsistencies in the relationship between sensor and surface during data collection
(b) Making parts of the image at a different scale to another part of the image
(c) Separating a scene into separate constituent parts and focusing on a smaller section to increase the resolution
(d) **Selectively preserving certain pixel frequencies in an image to enhance particular features or edges of objects**

30. In the process of image classification, which of the following methods results in a greater accuracy of classes within an image actually matching land use patterns on the ground?
(a) Manual/supervised by a user

(b) Robotic classification
(c) Fully automated
(d) Unprocessed image interpretation

31. A 512 x 512 image of 8 bits would require computer memory to store:
(a) 512 MB
(b) 1.44 MB
(c) 2.1 MB
(d) 8 MB

32. For edge detection which spatial filter would be most suitable?
(a) Gaussian
(b) Laplacian
(c) Low-pass
(d) None of the above

33. Base of image pyramid contains:
(a) Low resolution
(b) High resolution
(c) Intensity
(d) Blurred portion

34. High pass filters highlight:
(a) Low intensity components
(b) Mid intensity components
(c) High intensity components
(d) All components

35. In Hyperspectral remote sensing the EM Spectrum is:
(a) Continuous
(b) Discontinuous
(c) Discrete
(d) None of the above

36. An image enhancement technique that attempts to improve the contrast in an image by `stretching' the range of intensity values it contains to span a desired range of values is called?
(a) Non-histogram Equalization
(b) Non-linear contrast stretching
(c) Histogram Equalization
(d) Linear contrast stretching

37. Global Positioning Service (GPS) is based on a principle called:
(a) Transmission
(b) Trilateration
(c) Obliteration
(d) Globalization

38. The process of examining a remote sensing image and manually identifying the features in that image is called:
(a) Image interpretation
(b) Image classification
(c) Image building
(d) Image compression

39. In which process of remote sensing these fundamental parameters (size, shape, tone, texture, site, association, shadow, and pattern) are used:
    (a) Image interpretation
    (b) Image classification
    (c) Image building
    (d) Image compression

40. Multi Spectral Scanner (MSS) was on board on which satellite:
    (a) IRS-1A
    (b) NOAA-18
    (c) SPOT-1
    (d) Landsat-1

41. There are two main modes of scanning to acquire multispectral image data:
    (a) Parallel-track and side-track scanning
    (b) Parallel-track and along-track scanning
    (c) Across-track and along-track scanning
    (d) Across-track and side-track scanning

42. Which type of instrument provides the opportunity for each detector to have a longer dwell time, or residence time, over which to measure the energy from each ground resolution cell:
    (a) Across-track scanner
    (b) Side-track scanner
    (c) Parallel-track scanner
    (d) Linear arrays

43. RESOURCESAT-1 was launched in 2003 by:
    (a) USA
    (b) India
    (c) China
    (d) Russia

44. NOAA-19 satellite is having AVHRR sensor and orbiting in:
    (a) Geostationary
    (b) Sun-synchronous
    (c) Geo-synchronous
    (d) All of the above

45. ERS, Envisat, Sentinel and RISAT are example of which type of satellites:
    (a) Optical
    (b) Passive
    (c) Thermal
    (d) Microwave

46. SAR Interferometry technique requires:
    (a) An image
    (b) A pair of images
    (c) Scanner
    (d) Camera

47. An 8-bits image can have …… total number of pixel values:
    (a) 64
    (b) 128
    (c) 256
    (d) 65536

48. In false colour composite (FCC) image healthy vegetation appears:
    (a) Blue
    (b) Red
    (c) Green
    (d) Orange

49. An image that shows finer details is said to be of:
    (a) Finer resolution
    (b) Coarser resolution
    (c) Moderate resolution
    (d) None of the above

50. IFOV is angular cone of visibility of the:
    (a) Satellite
    (b) Scanner
    (c) Image
    (d) Sensor

------------------- Extra questions ----

1. Which one of the following helps to identify the objects on the earth surface?
    (a) Atmospheric window
    (b) Signature
    (c) Radiometric error
    (d) None of these

2. The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as:
    (a) Ozone hole
    (b) Atmospheric window
    (c) Ozone window
    (d) Black hole