

**M.Sc. ENVIRONMENTAL SCIENCE  
THIRD SEMESTER  
GEO-INFORMATICS  
MEV-303**

**Duration: 3 Hrs.**

**Marks: 70**

PART : A (OBJECTIVE) = 20

PART : B (DESCRIPTIVE) = 50

**[ PART-B : Descriptive ]**

**Duration: 2 Hrs. 40 Mins.**

**Marks: 50**

**[ Answer question no. One (1) & any four (4) from the rest ]**

1. What are the various components of GIS? Discuss the role of each component. (2+8=10)
2. What is Digital Image Processing (DIP)? Describe any one DIP technique in details. (2+8=10)
3. What are the various data structures employed in GIS? Describe the geometric properties of any one of them. (2+8=10)
4. What are the various elements of map layout? Prepare a standard map layout with a theme for an imaginary area. (4+6=10)
5. What is aerial photography? What is stereo pair? What are different types of aerial photographs? Discuss the history and development of aerial photography. (1+1+6+2=10)
6. What is GPS? Discuss the components and working principle of GPS. What is GNSS? Discuss the characteristic features of IRNSS. (1+6+1+2=10)
7. Define orbit. What are different types of orbits? Highlight the important features of geostationary satellites. What is Row and Path? (1+3+4+2=10)
8. What is spectral signature and spectral reflectance curve? Write the significance of spectral signature in remote sensing. Discuss the salient features of spectral signature for vegetation and soil. (2+2+6=10)

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**[ PART-A : Objective ]**

**Choose the correct answer /option from the following:**

**1×20=20**

1. Who is regarded as the 'father of modern GIS'?
  - a. Waldo Tobler
  - b. Peter Burrough
  - c. Jack Dangermond
  - d. Roger F. Tomlinson
2. Which one of the following is having vector data structure?
  - a. Satellite data in digital mode.
  - b. Scanned map.
  - c. Triangulated Irregular Network.
  - d. Photograph by a digital camera.
3. What does RMS error in georeferencing signify?
  - a. A measure of displacement of tie points.
  - b. A measure of connectivity.
  - c. Error in scale of map.
  - d. Error in area.
4. How many spectral bands are there in IRS-1C LISS-3 satellite data?
  - a. 2
  - b. 3
  - c. 4
  - d. 5
5. What is the decimal degree of 90°15'?
  - a. 90.15
  - b. 90.50
  - c. 90.25
  - d. 90.35
6. What is the dimension of line feature?
  - a. 0
  - b. 1
  - c. 2
  - d. 3
7. Which one of the following statement is true?
  - a. WGS84 is a geoid.
  - b. Raster data has topology.
  - c. Assam falls in UTM Zone 46 N.
  - d. Survey of India is not a data source for GIS.
8. How many raster cells are there to cover one hectare of land, if the spatial resolution of raster is 10 m?
  - a. 10
  - b. 100
  - c. 1000
  - d. 10,000
9. 256 grey levels are found in:
  - a. 7 bit image.
  - b. 8 bit image.
  - c. 10 bit image.
  - d. 16 bit image.
10. Whose statistical contribution is associated with digital image processing technique?
  - a. R. Navalgund
  - b. U. R. Rao
  - c. P. S. Roy
  - d. P. C. Mahalanabis
11. Which of the following nation has developed MSAS augmentation system?
  - a. USA
  - b. India
  - c. Japan
  - d. Russia
12. Which of the following satellite have maximum spatial resolution?
  - a. IKONOS
  - b. SPOT 7
  - c. LISS III
  - d. LANDSAT TM
13. Which of the following satellite scanner(s) is/are push broom scanner?
  - a. LISS series
  - b. WiFS
  - c. SPOT-1
  - d. All the above
14. Choose the correct one:
  - a. METEOSAT and INSAT are geostationary satellite.
  - b. LANDSAT and NOAA are sun synchronous satellite.
  - c. Near polar orbits are inclined at 90° - 100°.
  - d. All the above.

15. Which portion of Electromagnetic Spectrum is most suitable for vegetation study?

- a. Red
- b. IR
- c. NIR
- d. MIR

16. Which navigation system is characterized by 24 satellites, 6 orbital planes, positioned at 20,200 km, inclined at an angle of 55°?

- a. Galileo
- b. GLONASS
- c. NAVSTAR
- d. QZSS

17. Which image elements are arranged in ascending order of degree of complexity?

- a. tone-shape-pattern-association.
- b. pattern-tone-association-shape.
- c. shape-association-tone-pattern.
- d. association-pattern-shape-tone.

18. Which of the following is image enhancement technique?

- a. Spectral operation.
- b. Local operation.
- c. Point operation.
- d. All the above.

19. Which of the following classifier uses mean value of pixels of training sets?

- a. Parallelepiped classifier.
- b. Minimum distance classifier.
- c. Maximum likelihood classifier.
- d. None of the above.

20. In electromagnetic spectrum, water strongly absorbs in:

- a. MIR
- b. Blue
- c. FIR
- d. None of the above

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# UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA



**[PART (A) : OBJECTIVE]**

Duration : 20 Minutes

Serial no. of the  
main Answer sheet

Course : .....

Semester : ..... Roll No : .....

Enrollment No : ..... Course code : .....

Course Title : .....

Session : ..... 2017-18 ..... Date : .....

### Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

.....  
Scrutinizer's Signature

.....  
Examiner's Signature

.....  
Invigilator's Signature