

**M.Sc. ENVIRONMENTAL SCIENCE
THIRD SEMESTER (SPECIAL REPEAT)
FUNDAMENTALS OF GEO-INFORMATICS
MEV-303**

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

[PART-A : Objective]

Time : 20 min.

Marks : 20

Choose the correct answer from the following:

1X20=20

1. Through which of the following satellite GAGAN signals are being broadcast?
 - a. GSAT8
 - b. GSAT10
 - c. Both of the above
 - d. None of the above
2. METEOSAT is a type of:
 - a. Sun synchronous satellite
 - b. Geo synchronous satellite
 - c. Geostationary satellite
 - d. None of the above
3. Histogram of images are usually:
 - a. Unimodal
 - b. Bimodal
 - c. Trimodal
 - d. Multimodal
4. Which of the following regions are included in GAGAN GEO coverage?
 - a. Arabian Sea and Bay of Bengal Sea
 - b. Only Indian Ocean
 - c. East Asia and East Africa
 - d. All the above
5. GPS time is referenced to:
 - a. 6th January, 1980
 - b. 00:00:00 hrs.
 - c. First Sunday of 1980
 - d. All the above
6. What is dimension of a line object?
 - a. 0
 - b. 1
 - c. 2
 - d. 3
7. What is the term referred to define statistical distribution of image pixels?
 - a. Contrast
 - b. Histogram
 - c. Resolution
 - d. Convulation
8. What is the process known as by which values of individual pixels are changed based on values obtained in different bands?
 - a. Point operation
 - b. Local operation
 - c. Spectral operation
 - d. None of the above
9. Which of the following UTM zone is used to map a part of Meghalaya to be drawn in planner coordinate system?
 - a. UTM 44N
 - b. UTM 45N
 - c. UTM 46N
 - d. UTM 46S
10. What is the process that creates links between two images or digital maps?
 - a. Rectification
 - b. Registration
 - c. Resampling
 - d. None of the above

11. Which of the following nation has developed EGNOS SBAS?
 - a. USA
 - b. EU
 - c. India
 - d. Japan
12. Which of the following satellite have maximum spatial resolution?
 - a. CARTOSAT
 - b. LANDSAT OLI
 - c. LISS III
 - d. LANDSAT TM
13. Which of the following can be done in GIS?
 - a. Data input and output
 - b. Data storage and retrieval
 - c. Data manipulation and analysis
 - d. All of the above
14. Which of the following is considered in Positional Dilution of Precision (PDOP)?
 - a. Latitude
 - b. Longitude
 - c. Altitude
 - d. All of the above
15. When the first GPS satellite PRN4 was launched?
 - a. 22nd Feb, 1978
 - b. 6th Jan, 1980
 - c. 22nd May, 1978
 - d. 5th Dec, 1973
16. GLONASS constellation is characterized by:
 - a. 24 operational satellites, 19,130 km orbital height and Roscosmos operator
 - b. 24 satellites, 6 orbital planes and 20,200 km orbital height
 - c. 36 total satellites, 34 operational satellites, 4 orbits and 12,660 km orbital height
 - d. None of the above
17. Where the Master Control Station of GPS control segment is located?
 - a. Kwajalein
 - b. Diego Garcia
 - c. Colorado Springs
 - d. Hawaii Island
18. Which of the following is not an image enhancement technique?
 - a. Image classification
 - b. Spectral operation
 - c. Noise reduction
 - d. Spatial operation
19. Which of the following classifier uses mean value of pixels of training sets?
 - a. Parallelepiped classifier
 - b. Maximum likelihood classifier
 - c. Minimum distance classifier
 - d. None of the above
20. Which of the following vector data structure reveals topological information?
 - a. Spaghetti structure
 - b. Whole polygon structure
 - c. Point and Polygon structure
 - d. None of the above

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(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

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

1. a. What is GPS? Explain different segments of GPS and their functions. 5+5=10
b. Write a brief note on applications of GPS.
2. a. What do you mean by visual image interpretation? What are the factors governing quality of an image and interpretability? 5+5=10
b. Discuss the key elements of image interpretation.
3. a. Define spectral reflectance curve. What is the significance of spectral signature in remote sensing? 5+5=10
b. Discuss the salient features of spectral signature for vegetation and the factors affecting it.
4. What is remote sensing? What are the various platforms of remote sensing? Explain the working principle of optical remote sensing with suitable diagram. 1+3+6=10
5. a. What is raster and vector data? Differentiate between them citing suitable example. 5+5=10
b. What is topology? Discuss different types of vector data structures.
6. a. What is georeferencing? Discuss the process of georeferencing with suitable example. 5+5=10
b. Write a brief note on Coordinate system and Projection system.
7. a. What do you mean by Digital Image Processing? What are the techniques of DIP? What are different types of resolution? 5+5=10
b. What is image classification? What are different techniques of image classification? Discuss any one technique of digital image classification.
8. Write short notes on: 5+5=10
a. NAVSTAR system
b. IRNSS

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