2022/07

M.Sc. ENVIRONMENTAL SCIENCE
FOURTH SEMESTER
GEOINFORMATICS: APPLICATIONS IN MAJOR AREAS
MEV-403C

Duration : 3 hrs. **Full Marks: 70**

(PART-A: Objective)

Time : 20 min. **Marks : 20**

Choose the correct answer from the following: *1X20=20*

1. GIS technology is used to analyze the urban growth and its?
   a. Direction of expansion
   b. Fine suitable sites
   c. Further development
   d. All of these

2. Which of the following is the key function of planning?
   a. Economic growth
   b. Population expansion
   c. Environment degradation
   d. All of these

3. GIS can help to identify areas of conflict of land development with the environment by which of the following technique?
   a. Manipulate
   b. Spatial Query
   c. Overlay Analysis
   d. All of these

4. Which of the following GIS may perform in flood management?
   a. Can form a map on areas where flooding occurs
   b. Can allow the creation of flood simulation models
   c. Can allow the mapping of evacuation routes by use of imagery captured
   d. All of them

5. The careful management of water catchment areas results in?
   a. More desertification
   b. More deforestation
   c. Less waste of water
   d. More waste of water

6. _____is a combination of drainage or integration of different kinds of drainage patterns.
   a. Drainage texture
   b. Dendritic drainage
   c. Rectangular drainage
   d. Deranged drainage pattern

7. Which of the following problems might 3D data models be applied to?
   a. Polygon overlay
   b. Hydrological models
   c. Visibility analysis
   d. Network analysis

8. The various applications in water resources wherein remote sensing may substitute the conventional methods are:
   a. Rainfall Estimation, forecasting and monitoring
   b. Evaporation and evapotranspiration studies
   c. Hydrologic modelling-rainfall-runoff models etc
   d. All of the above

9. What are the helping factors of Watershed Management?

a. To cope with country's energy crisis
b. Appropriate funds must be allocated
c. Evolve a long watershed policy for conserving the country's watershed
d. All of the above

10. What is the advantage of multiple flow direction algorithm?

a. Unlike the D8-algorithm they can be used more than once
b. They are based on random numbers
c. They allow water drainage to more than one adjacent cell
d. They are particularly fast.

11. Which of the following LULC falls under Level-II category of NRSC LULC classification?

a. Crop Land
b. Fallow
c. Plantation
d. All the above

12. What level of LULC classification is usually carried out using data between 1:20,000 to 1:80,000 scale?

a. Level-I
b. Level-II
c. Level-III
d. Level-IV

13. Which interpretation keys can be used to identify evergreen forest in a FCC image?

a. Tone- dark red; Texture- coarse; Pattern- contiguous; Shape- irregular
b. Tone- pink red; Pattern- contiguous; Shape-regular
c. Tone- greenish red; Texture- smooth; Pattern- scattered; Shape- irregular
d. Tone- red; Pattern- smooth; Shape-regular

14. Which remote sensing satellite can be used in earth quake monitoring?

a. MODIS
b. INSAT
c. LANDSAT
d. PALSAR

15. What is the ideal spatial resolution for landscape level studies?

a. 100m
b. 20-30m
c. less than 10m
d. 30-50m

16. Which data layers will be most useful in identifying vulnerable landslide areas?

a. Slope, elevation, soil type, drainage and LULC
b. Forest density, elevation and buildings
c. Population density, LULC, drainage
d. None of the above

17. Unused or leftover shifting cultivation areas are considered as

a. Scrub forest
b. Scrub land
c. Wasteland
d. Uncultured land

18. Which type of data is useful in disaster response and recovery?

a. Satellite imageries
b. Aerial photographs
c. UAV data
d. All the above

19. Satellite data with 2-6m spatial resolution is suitable for
    a. Cartography
    b. Urban planning
    c. Both the above
    d. None of the above

20. Data from which satellite can be used to monitor fire.
    a. MODIS
    b. SERVIR
    c. AFIS
    d. all the above

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(PART-B : Descriptive)

Time: 2 HRS 40 MINS **Marks : 50**

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

1. What is LULC? Why LULC classification is important? Critically discuss the USGS Anderson classification or NRC LULC 50K classification system. 1+2+7=10

2. Discuss the application of GIS in planning and development. How does GIS help in planning smart cities? 5+5=10

3. How does GIS help in the mapping and planning for the growth and development of transportation in a region? 6+4=10

4. **Write short note on** 5+5=10
   a) Importance of LULC study in earth's resource management
   b) Criteria for USGS LULC classification scheme

5. Explain the role of Remote Sensing and GIS in water resources application in today's scenario. 5+5=10

6. Critically discuss how different tools and models of GIS can be used for environment and climate change monitoring. Give suitable examples in support of your answer. 10

7. "Remote sensing and GIS have emerged as most powerful tools for morphometric analysis for the development of the regional hydrological models for solving various hydrological problems." Elucidate the statement with examples. 10

8. Critically discuss the role of geoinformatics in hazards and disaster management with suitable examples. 10

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