NATIONAL INSTITUTE OF RURAL DEVELOPMENT & PANCHAYATI RAJ

RAJENDRANAGAR, HYDERABAD – 500 030

POST GRADUATE DIPLOMA IN GEO SPATIAL TECHNOLOGIES APPLICATIONS IN RURAL DEVELOPMENT (PGD-GARD) - II Semester

Fifth Batch (2020-21)

Course No. GARD-507: Course Title: Remote Sensing –II

ASSIGNMENT QUESTIONS

Total Marks: 30

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Note: Answer any five questions at least one from each Block.

- ❖ Each question carries six marks
- ❖ Length of Assignment on A-4 size sheets should be about 1200-1500 words
- ❖ Write neatly & legibly in your own handwriting,
- ❖ Assignments should preferably be strengthened by adding sketches, photographs, tables and graphs etc
- ❖ **Name of the Student/ Enrolment Number/Course code/ Block Number & Question Number should be clearly mentioned.**
- ❖ **Each page should be properly numbered.**

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Block-1: Optical Remote Sensing

1. Write a brief note on Satellite Orbit in Remote Sensing
2. What is the resolution in remote sensing and explain various types with a proper example as Indian satellite data sets?
3. How do you differentiate various features such as soil, water and vegetation using spectral signatures?
4. What kind of pre-processing steps will perform before supplying the data to the users?
5. Expand following terminologies and useful in the appropriate applications
   (a) CAPE   (b) NDVI   (c) NWIP   (d) SST (e) NUO

Block-2: Thermal Remote Sensing

6. Where and how the thermal radiation laws are useful in remote sensing?
7. How do you can calculate the thermal properties on Terrain? Explain on the EMR Spectral.
8. What is the importance of Radiometric Calibration in remote sensing?
9. How the thermal remote sensing is useful in forest applications? Explain with appropriate satellite data examples.

Block-3: Hyper spectral Remote Sensing

10. What is Image Spectrometer? How it is useful in spectral analysis?
11. What is the difference between multispectral and Hyperspectral remote sensing? Explain with any Indian Remote Sensing satellite data.
12. Explain the concept of Imaging Spectroscopy
13. Expand and discuss on following terminologies
    (a) ACORN   (b) FLAASH   (c) TOA   (d) PCA   (e) MNF
14. How Hyperspectral remote sensing is useful to identify various crops? Explain with suitable examples.
15. What do you mean RED-EDGE? How it will be useful for agricultural?

Block-4: Micro Wave Remote Sensing

16. Write a brief note on System parameters of microwave remote sensing
17. Discuss about Slant Range distortions in RADAR images
18. What are the different polarisation in SAR images? Explain their importance as applications specific
19. How the microwave remote sensing useful in crop identification? Explain with suitable examples using Indian satellite data

Block-5: Geostationary and Navigational Satellites

20. Write a brief note on GNSS of various counties as examples
21. What is the principle of GPS to obtain the position?
22. What is the DOP? Explain various DOP and importance in GPS surveying
23. Discuss on various signals and their importance on accuracy
24. What is GAGAN? How will be useful for various applications as accuracy aspect?

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POST GRADUATE DIPLOMA IN GEO SPATIAL TECHNOLOGIES APPLICATIONS IN RURAL DEVELOPMENT (PGD-GARD)

Fifth Batch (2020-21)

Course No. GARD-508: Course Title: Spatial Data Analysis and Modelling

<u>ASSIGNMENT QUESTIONS</u>

Total Marks: 30

Note: Answer any five questions at least one from each Block.

- ❖ Each question carries six marks
- ❖ Length of Assignment on A-4 size sheets should be about 1200-1500 words
- ❖ Write neatly & legibly in your own handwriting,
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Block-1: Spatial Analysis and Modelling

1. Explain about the spatial analysis and Steps on Solving a Spatial Problem?

2. Explain the role of GIS in spatial analysis and various types of reclassification with suitable examples?

3. Brief about the buffer function in GIS? Write in detail the various types of buffering operations with neat diagrams?

4. Illustrate vector overlay analysis and write a note on polygon-on-polygon overlay analysis in vector overlay?

Block-2: Network Analysis

5. Explain the network data model and Basic elements of network data model?

6. (a) Explain the Best path analysis?
   (b) Route tracing and layers required for route tracking?

7. How to Create a Road Network Dataset & Discuss Route Tracing &VRP

8. (a) List the areas of use of location-allocation modelling
   (b) Discuss the Origin and Destination (OD) Cost Matrix Analysis and Steps in GIS with suitable example?

Block-3: Surface Analysis

9. (a) What is Surface Analysis? What are the benefits of terrain datasets?
   (b) Discuss various data source used for generating surfaces?

10. How will you generate TIN and DEM and also uses of DEM?

11. (a) What is interpolation and Explain different interpolation methods?
    (b) Describe Slope, Hill shade and Profile Generation?

12. (a) Describe about Watershed Delineation using ArcGIS?
    (b) Discuss the GIS and Watershed Evaluation?

Block-4: Modelling

13. What is a process model and explain the use of GIS in process modeling?

14. (a) How to build a spatial model?
    (b) Describe various stages in the process of modeling?

15. (a) Explain the concept of multi criteria evaluation?
    (b) Describe the steps in building MCE?

Block-5: Crowd Sourcing, Navigational and Location Based Services and Visualisation of Spatial Data Analysis and Modelling Output

16. What is Crowd sourcing and List various types of Crowd sourcing?

17. Discuss various stages in Crowdsourcing and List the advantages and disadvantages of Crowdsourcing?

18. (a) What is navigation and LBS?

    (b) List the areas of application of navigation and LBS/RTLS

19. (a) Explain in detail Mapping Techniques?

    (b) What are non-cartographic outputs?
    (c) Write a note on Tables and Charts?

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POST GRADUATE DIPLOMA IN GEO SPATIAL TECHNOLOGIES APPLICATIONS IN
RURAL DEVELOPMENT (PGD-GARD) - II Semester
5th Batch (2020-21)

Course No. GARD-509

Course Title: Spatial Decision Support System (SDSS) for Rural Development

ASSIGNMENT QUESTIONS

Total Marks: 30

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Note: Answer any five questions at least one from each Block.

- ❖ Each question carries six marks
- ❖ Length of Assignment on A-4 size sheets should be about 1200-1500 words
- ❖ Write neatly & legibly in your own handwriting,
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Block 1: Spatial Decision Support System

1. What are the elements influenced and involved in SDSS?

2. (a) Explain the Process of decision- making with a neat sketch?
   (b) Discuss about decision making under certainty, risk and uncertainty.

3. (a) Brief about Multi Criteria Decision-Making (MCDM with example?
   (b) Define MCE with its standard procedures.

Block 2: SDSS Architecture

1. Explain SDSS Architecture in terms of the following**.**
   (a) Characteristics of SDSS?
   (b) Relationship between SDSS and DSS
   (c) Components of SDSS.

2. Briefly discuss about Data Integration, Management and Organisation in SDSS?
3. Explain the procedure for Spatial Database creation?
4. Describe Environmental Modeling through Geo-informatics in SDSS?

Block 3: SDSS based case studies of various applications

1   (a) What is the importance of SDSS in Agriculture?
      (b) What is the use of SDSS in Land Evaluation?

2. (a) How does SDSS deal with precision farming practices?
    (b) Discuss the role of SDSS in precision agriculture practices of the agriculture land?
    (c) Discuss about process methodology and analytical framework?

3. (a) What is the role of DSS for crop management?
    (b)Discuss about Remote Sensing-based Decision Support for Precision Farming?

4. (a) Explain importance of technologies like RS, GIS, GPS, Internet and mobile
      Communications in disaster management?
    (b) Discuss about decision support tools with examples?

5. (a) Briefly discuss about MGNREGA?
    (b) Explain the GIS implementation of Mahatma Gandhi NREGA assets?

6. Elaborate on the importance of the DSS in health management with a case study?

7. What is Environmental Impact Assessment (EIA)? Describe the process and formation of EIA?

8. Describe Land Capability Classification?

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POST GRADUATE DIPLOMA IN GEO SPATIAL TECHNOLOGIES APPLICATIONS IN RURAL DEVELOPMENT (PGDGARD)

5th Batch (2020-21), 2nd Semester

Course GARD-510: Natural Resources Management
<u>**ASSIGNMENT QUESTIONS**</u>

Total Marks: 30

Note: Answer any five questions at least one from each Block.

- ❖ Each question carries six marks
- ❖ Length of Assignment on A-4 size sheets should be about 1200-1500 words
- ❖ Write neatly & legibly in your own handwriting,
- ❖ Assignments should preferably be strengthened by adding sketches, photographs, tables and graphs etc
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Block-1: WATER RESOURCES

1. Write short notes on Application of Remote Sensing in
   (a) Rainfall Runoff Modelling (b) Water Balance studies (c) Water Quality studies.

2. Discuss briefly on (a) Hydrological cycle (b) Porosity (c) Permeability
   (d) Specific yield and Specific Retention (e) Storativity

3. Discuss the following flood forecasting modelling approaches:
   (a) Computing runoff volume (b) Modelling direct runoff (c) Flood Routing
   (d) Calibration of the model (e) Model validation

4. What is the role of R S for (a) Ground water targeting (b) Irrigated command area management?

5. (a) What is the role of remote sensing in near real time flood monitoring?
   (b) Write detail note on Drought Monitoring?

6. (a) How you will map Water Logging and Soil Salinity in Irrigation Systems?
   (b) Give a brief note on Monitoring & Assessment of Watershed Interventions?

Block-2: AGRICULTURE &ALLIED SECTORS

7. (a) Explain the different vegetative indices
   (b) Differentiate Freshwater and Brackish water aquaculture
   (c) Explain the Remote Sensing of Ocean colour

8. (a) What are the factors that affect the soil formation?
   (b) What is interpretative grouping of soils?
   (c) Describe any one structure of soil taxonomy.

9. (a) What are the different techniques of hyperspectral remote sensing data processing?
   (b) What are the different methods of LST estimation
   (c) How microwave remote sensing is useful to agricultural studies

Block-3: FOREST

10. Write the advantages of hyperspectral, microwave and LiDAR RS of forests.

11. Discuss in detail various methodological steps involved in digital image processing for
    (a) forest type mapping (b)forest stock mapping

12. (a) Explain the conventional methods of biomass assessment of forests.
    (b) What are the advantages of different RS techniques in quantification of spatial Biomass.

13. (a) Explain the difference between forest cover and forest type mapping.
    (b)What parameters of forest fire disturbance can be monitored and mapped using RS?

14. What is wildlife habitat analysis? Explain different spatial and a spatial components in Wildlife habitat analysis.

15.(a) Explain the need to biodiversity assessment at landscape level.
    (b) What are the different ecological, environmental, geographical and spatial factors to be considered in biodiversity assessment at landscape level.

16. Explain the evaluation and services of Indian Bio-resource Information Network (IBIN).

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