NATIONAL INSTITUTE OF RURAL DEVELOPMENT & PANCHAYATI RAJ
Rajendranagar, Hyderabad – 500 030

Post Graduate Diploma in Geo Spatial Technology Applications in Rural Development (PGDGARD) Fourth Batch (2019), 2nd Semester

COURSE GARD - 507: THE REMOTE SENSING-II

ASSIGNMENT QUESTIONS

Total Marks: 30

Note: Answer any Six questions, minimum one from each block.

1. Each question carries Five (5) marks.
2. Assignment should be written on A-4 size paper with $1^{1/2}$ space and length of each question should be about 500-800 words.
3. Write neatly without much correction and in your own legible handwriting,
4. Wherever necessary include sketches, photographs, tables and graphs etc.
5. Write clearly Your Name and Enrolment No. on the top of cover page of each subjectseparately (should not be bound with other Assignments).

Block-1: Optical Remote Sensing

1. (a) What is electromagnetic spectrum?

   (b) Explain the part of the spectrum is maximally reflected / scattered by green vegetation?
2. (a) What is a pixel?
   (b) Different types of resolution and their definitions.
3. (a) Brief about geostationary orbit and polar orbit?
   (b) Advantages of satellite remote sensing?
4. How can remote sensing be used in
   (a) Agriculture (b) Disaster management
5. Give examples of EM regions and their applications

Block-2: Thermal Remote Sensing

6. (a) What is Atmospheric Windows in the Thermal IR Region?
   (b) Describe Thermal properties of the terrain.
7. Describe the following
   (a) Planck's Blackbody Radiation Law (b) Stefan-Boltzmann Law
   (c) Wien's Displacement Law

8. How thermal remote sensing is used for bruise detection and nursery monitoring

9. How thermal remote sensing is applied in
   (a) Disease and pathogen detection (b) Maturity evaluation (c) Yield forecasting

10. Write the thermal remote sensing used in
    (a) Irrigation scheduling (b) Water resources (c) Soil salinity studies

Block-3:Hyper spectral Remote Sensing

11. (a) Difference between Hyper spectra land Multispectral Remote Sensing?
    (b) Explain about data dimension reduction using MNF.

12. Explain the types of Hyper spectral Imaging Sensors.
13. What is Pixel Purity Index ? and Band reduction in hyper spectral image.
14. Briefly discuss the typical reflectance pattern of leaf and causes of spectral characteristics.
15. Discuss on
    (a) Spectral features for Soil Organic carbon studies.
    (b) Features used in identifications of Rocks and Minerals.

Block-4: Micro Wave Remote Sensing

16. Explain Active & Passive Microwave Remote Sensing with examples.
17. Discuss the properties of Microwave Remote Sensing.
18. What are the types of Scattering Mechanism in Remote Sensing? Explain.
19. Differentiate microwave remote sensing and optical remote sensing in brief?
20. Brief any Three Applications of Microwave Remote Sensing

Block-5: Geostationary and Navigational Satellites

22.Brief Geostationary and Geosynchronous satellite systems with their advantages.

23. Explain the Global Navigational Satellite System and its types with a neat sketch.

24. Discuss about (a) IRNSS (b) GAGAN.

25. What is trilateration? Explain different errors associated with the positioning system.

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GARD - 508: SPATIAL DATA ANALYSIS AND MODELLING

ASSIGNMENT QUESTIONS

Total Marks: 30

Note: Answer any Six questions, minimum one from each block.

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Block-1: Spatial Analysis and Modeling

1. Write a note on spatial analysis and List a few issues in spatial analysis
2. The role of GIS in spatial analysis and what are the preliminary steps to be done before spatial analysis?
3. Brief the Preparation of Data and Major tools in Spatial Analysis?
4. Explain in detail the measurement of length / perimeter and area in Raster & Vector Data?
5. What do you mean by buffer? Explain various types of buffering operations with neat diagrams.

Block-2: Network Analysis

6. (a) Explain the concept of network.
   (b) How a network can be modelled?
7. (a)List the steps involved in Dijkstra's algorithm for solving the shortest path problem.
   (b) Explain in detail the steps involved in the creation of network dataset.
8. Explain the Elements & Tools of Network Data model.

9. How to Create a Road Network Dataset & Discuss Route Tracing &VRP.
10. (a) List the areas of use of location-allocation modelling.
    (b) Discuss the concept of OD cost matrix with suitable example.

Block-3: Surface Analysis

11. (a) What is Surface Analysis? What are the benefits of terrain datasets ?
    (b) Discuss various data source used for generating surfaces ?
12. Explain the methods adopted in generating
    (a) TIN (b) DEM.
13. Describe the derivative products from DEM and also uses of DEM?
14. (a) Explain different interpolation methods.
    (b) Describe view shed and intervisibility.
15. Brief about Watershed Delineation and Evaluation Analysis

Block-4: Modeling

16. What is a spatial model and how to build a spatial model?
17. Explain the problems and also stages in abstracting Features.
18. Write in detail about different types of models.
19. Explain RUSLE model? Explain the use of GIS in process modelling.
20. What are the various methods of MCE? Describe the steps in building MCE.

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

21. (a) What is Crowd sourcing and list various types of crowd sourcing?
    (b) List the advantages and disadvantages of Crowd sourcing.
22. (a)Explain the factors of next generation Crowd sourcing.
    (b) Discuss various stages in Crowd sourcing.
23. (a)What is navigation and explain the types of Navigation?
    (b) List the areas of application of navigation and LBS/RTLS.
24. (a) Differentiate Cartographic and non-cartographic outputs?
    (b)Write a note on web based map service.
25. Explain in brief map design and layout?

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COURSE GARD - 509: SPATIAL DECISION SUPPORT SYSTEM (SDSS)

ASSIGNMENT QUESTIONS

Total Marks: 30

Note: Answer any Six questions, minimum TWO from each block.

6. Each question carries Five (5) marks.
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8. Write neatly without much correction and in your own legible handwriting,
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Block 1: Spatial Decision Support System

1. (a) Define SDSS? What are the roles of SDSS in GIS?
   (b) Describe the five key modules of SDSS.

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

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

4. (a) Define MCE with its standard procedures.
   (b) Brief about AHP.

Block 2: SDSS Architecture

5. (a) Characteristics of SDSS?
   (b) Relationship between SDSS and DSS
   (c) Components of SDSS.

6. Briefly discuss about Data Integration and Management in SDSS.

7. What are the functions of the GIS for manipulation and analysis?

8. Describe Environmental Modeling through Geo-informatics in SDSS.

Block 3: SDSS based case studies of various applications

9. (a) What is the importance of SDSS in Agriculture?
   (b) What is the use of SDSS in crop condition assessment?

10. (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.

11. (a) What is the role of DSS for crop management?
    (b) Discuss about DSS architecture?

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

13. Briefly discuss about MGNREGA and Explain the process of Geo-tagging for MGNREGA assets.

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

15. What is EIA? Describe the process and formation of EIA.

16. Explain components of land capability and how it is related with land capability Classification?

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COURSE GARD - 510: NATURAL RESOURCES MANAGEMENT

ASSIGNMENT QUESTIONS

Total Marks: 30

Note: Answer any Six questions, minimum TWO from each block.

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2. Assignment should be written on A-4 size paper with $1^{1/2}$ space and length of each question should be about 500-800 words.
3. Write neatly without much correction and in your own legible handwriting,
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Block-1:WATER RESOURCES

1. Write a Short note on applications of Remote sensing in
   (a) Water Resources
   (b) Water Quality studies.
2. (a)Write a short note on ground water province in the country.
   (b) What is the role of Remote sensing for Ground water targeting in hard and soft rocks?
3. (a) Discuss Flood forecasting modelling.
   (b) Write detail note on Drought Monitoring?
4. (a) What is the role of remote sensing for irrigated command area management?
   (b) How you will map Water Logging and Soil Salinity in Irrigation Systems?
5. Discuss in brief the following
   (a)Quantification of Soil Erosion Using RUSLE (b) Rainfall-Runoff Erosivity Factor
   (c)Soil Erodibility Factor (d) Cover – Management Factor

Block-2:AGRICULTURE &ALLIED SECTORS

6. (a) Write a note on Acreage Estimation
   (b) Crop Monitoring and Condition Assessment
7. Role of Remote sensing in
   (a) Fisheries (b) Aquaculture (c) Coastal Zone Management
8. Explain Visual Interpretation Techniques in Soil Resource Mapping.
9. Explain the Spectral behaviour of different soils.
10. Discuss about different Indices in Agriculture applications.

Block-3:FOREST

11. Explain the role of Geoinformatics in mapping, monitoring and management of forests.
12. Define remote sensing and discuss on the key physical based principles on remote sensing of vegetation with respect to spectral characteristics and vegetation structure.
13. (a) What parameters of forest fire disturbance can be monitored and mapped using remote sensing ?
    (b) Give details on the advantages of using space based platforms for fire fighting and management
14. (a) Explain the difference between forest cover and forest type mapping.
    (b)Discuss in detail various methodological steps involved in digital image processing for forest type mapping.
15. What are invasive species and explain their ecological and economic effects ? Explain in brief how remote sensing and GIS can be used in mapping and management of invasive species.

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