Last date for submission of Assignments is 31-12-2018

Title of the course: PGD-GARD - **II Semester**

Third Batch (2018) - ASSIGNMENT

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

Total Marks: 30

Note: Answer Six questions, one from each block and choose sixth from block-3.

1. Each question carries Five (5) marks.
2. Assignment should be written on A-4 size 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 Top of the cover page of the Assignment and this should not be bound with other Assignments

Block-1 : Optical Remote Sensing

1. (a)What is EMS? Draw the typical reflectance vs wavelength plot for a green leaf
   (b) What are the types of resolution involved in RS? Explain with examples.

2. (a) List the types of remote sensing platforms with examples
   (b) What is the difference between true color and false color images?
   © What is the advantage of using multi-temporal imagery?

3. (a) What is the difference between multiple spectral and hyper spectral remote sensing?
   (b) What is the difference between unsupervised and supervised classifications?

4. Describe the application of remote sensing in the field of
   (a) Agriculture (b) Water resources (c) Geosciences

5. (a) List the various applications of remote sensing in Forestry.
   (b) Brief the applications of remote sensing in Oceanography
   (c) Write short note on applications of RS in Soils

Block-2 : Thermal Remote Sensing

6. (a) What is Atmospheric Windows in the Thermal IR Region?
   (b)Describe Radiation of real Materials and Emissivity

7. Describe the following
   (a) Planck's Blackbody Radiation Law (b) Stefan-Boltzmann Law
   (c) Wien's Displacement Law

8. What is apparent thermal inertia? Describe Thermal properties of the terrain

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

10. Write the thermal remote sensing applications in
    (a) Forest fire detection (b) Water resources (c) Soil salinity studies.

Block-3 : Hyperspectral Remote Sensing

11. (a)What are the advantages of Hyperspectral over Multispectral Remote Sensing?
    (b)Explain in short about data dimension reduction using Minimum Noise Fraction(MNF)

12. Enlist few Airborne, Spaceborne and Plantary Hyperspectral Imaging Sensors.

13. Discuss about band reduction in hyperspectral image using PCA.

14. Explain different image classification techniques used in hyperspectral data analysis.

15. Briefly discuss the applications of hyperspectral remote sensing in
    (a)Crop study (b) forest species mapping. (c) Rocks and Minerals

16. (a) What is Red Edge Position? How Red Edge Position is computed.
    (b) Discuss Soil spectral features for Soil Organic carbon studies.

Block-4 : Micro Wave Remote Sensing

17. What is RADAR? Explain the effect of dielectric constant in microwave remote sensing?

18. What are the advantages of microwave remote sensing over the optical remote sensing?

19. What do you understand by polarization? What are the various polarimetric applications?

20. What are the commonly used frequency bands in microwave RS? Give the band widths and their applications.

21. Write notes on (a) Foreshortening (b) Lay-over (c) Radar Shadow

Block-5 Geostationary and Navigational Satellites

22 (a) What is Geostationary and Geosynchronous satellite?
   (b) Explain the advantages of Geostationary satellites.
   (c) List the Indian Geostationary Satellites.

23. (a) Explain the Global Navigational Satellite System.
    (b) What are the different types of navigational system?
    (c) Write the applications of the navigational system.

24. Describe in brief Indian Regional Navigational Satellite System (IRNSS) and GAGAN.

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Last date for submission of Assignments is 31-12-2018

Title of the course: PGD-GARD

Third Batch (2018)

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

ASSIGNMENT

Total Marks: 30

Note: Answers any Six questions, minimum One from each block.

1. Each question carries Five (5) marks.
2. Assignment should be written on A-4 size 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: Spatial Analysis and Modeling

1. (a) What is the role of GIS in spatial analysis?
   (b) Discuss the various types of data used in spatial analysis.
   (c) Write a note on filter analysis.
2. Explain in detail the measurement of length, perimeter and area in vector GIS?
3. Explain in detail the various types of reclassification methods with suitable examples.
4. What do you mean by buffer? Classify the types of buffers with neat diagrams
5. Illustrate vector overlay analysis and raster overlay analysis.
6. (a)Write a detail note on map generation
   (b)Write a note on polygon-on-polygon overlay analysis

Block-2: Network Analysis

7. (a) Write in detail the various sources of network data.
   (b) Classify the network based on its types
   (c) Explain about network data model.
8. (a)Explain in detail the steps involved in the creation of network dataset.
   (b)The shortest path problem – illustrate in detail.
9. (a)Write the need for best path analysis in GIS.
   (b)Discuss in detail route tracing analysis.

10. (a)Write a detailed note on location-allocation modeling.
    (b) List the areas of use of location-allocation modeling.

11. (a) How GIS can be used to find the service area of a facility?
    (b) Explain the use of closest facility tool in network analysis.

Block-3: Surface Analysis

12. (a) What are the benefits of terrain analysis?
    (b) List the sources of data used for generating surfaces?

13. (a) Explain how will you generate Triangular Irregular network?
    (b) Describe the derivatives from DEM.

14. (a) What is surface analysis? List the tools of surface analysis.
    (b) Describe viewshed and intervisibility.

15. (a) Explain different interpolation methods.
    (b) Explain the use of tools of GIS in watershed management.

Block-4: Modeling

16. What is a model and modeling? Describe various stages in the process of modeling.

17. Write in details different types of models.

18. Illustrate continuous and discrete models.

19. What is a process Model? Explain the use of GIS in process modeling.

20. Explain the concept of multi criteria evaluation.?What are the advantages and disadvantages MCE?

21. 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

22. (a) What is Crowd sourcing and list various types of crowd sourcing?
    (b) List the advantages and disadvantages of Crowd sourcing.

23. (a) Discuss various stages in Crowd sourcing.
    (b) Explain Indian examples of Crowd sourcing.

24. (a) What is navigation and LBS?.Describe components of road navigation.
    (b) List the areas of application of navigation and LBS/RTLS.

25. (a) Explain the methods of finding location of a mobile device.
    (b)Write a note on web based map service.

26. List the cartographic output.? Explain in detail mapping techniques

27. What is map design and layout? Explain non-cartographic outputs?

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Last date for submission of Assignments is 31-12-2018

Title of the course: PGD-GARD

Third Batch (2018)

Course No. GARD-509: Course Title: Spatial Decision Support System (SDSS)

ASSIGNMENT

Total Marks: 30

Note: Answers any Six questions, Three from each Part

1. Each question carries Five (5) marks.
2. Assignment should be written on A-4 size 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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PART-A

1. (a) Define SDSS? What are the components of SDSS?
   (b) According to Geoffrions definition what characteristics are needed for SDSS
   (c) Briefly describe the purpose and content of each of the five key modules of SDSS.

2. (a) What are the elements involve in decision making
   (b) Describe the procedure of decision making and explain briefly one of them.
   (c) Discuss about categories of decision. Explain Keller's decision making process

3 (a) Brief the elements influence decision making?
   (b) Describe probabilistic and Deterministic model and differentiate between them.
   (c) Discuss about decision-making under Certainty, Risk and Uncertainty

4. (a) Explain the relationship between SDSS & DSS? What is the future scope of SDSS?
   (b) What are the components and software requirements for SDSS?
   (c) Briefly discuss about development tools which used in SDSS?

5. (a) What is the use of SDSS in crop condition assessment?
   (b) Discuss about methods of Land evaluation using SDSS.
   (c) What is the importance of SDSS in agriculture?

6. (a) How to normalize the matrix in Multi Criteria Decision Making (MCDM) for the Beneficial & Non Beneficial criteria's?
   (b) How we can represent the negative impact of criteria in AHP?
   (c) How can I aggregate different group final scores in AHP and ANP?

7. (a) Describe the components of SDSS Architecture
   (b) What are the elements and capabilities of GIS database design?
   (c) Explain the procedure for the spatial database creation?

8. (a) What are the manipulation and analysis functions of GIS?
   (b) Give typical applications using manipulation and analysis functions?
   (c) What is NODATA? How you will represent data in Grid Format?

PART-B

9. (a) Detail on Environment Modeling with GIS
   (b) Explain in detail about Cellular Automa.
   (c) Explain importance of the DSS in health management with a case study.

10. (a) How SDSS deals with precision farming practices?
    (b) Discuss role of SDSS in precision agricultural practices of the Agricultural land.

11. (a) Write an essay on Crop Discrimination and Acreage Estimation
    (b) Explain briefly decision parameters of SDSS in precision farming practices.

12. (a) What is the role of DSS for crop management?
    (b) Discuss Crop Models for Decision Making
    (c) What are the spatial databases needed for Rice Decision Support System?

13. (a) Discuss about Geo-informatics tools for Biodiversity Assessment
    (b) Detail on Biodiversity Information System (BIS)

14. (a) What is the role of Geomatics in transport management
    (b) Detail on application of Geomatics in New Route Location
    (c) Explain the process of LIDAR mapping for Transportation.

15. (a) Explain importance of technologies like RS, GIS, GPS, Internet and mobile Communications in disaster management?
    (b) What types of datasets are required for disaster management?

16. (a) Write a short note about SISMS. Discuss SISMS application using Map Server and PHP on health management
    (b) Explain components of land capability, how it is related with land capability Classification?

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Last date for submission of Assignments is 31-12-2018

Title of the course: PGD-GARD

Third Batch (2018)

Course No. GARD-510: Course Title: Natural Resources Management

ASSIGNMENT

Total Marks: 30

Note: Answers any Six questions, Two from each block.

1. Each question carries Five (5) marks.
2. Assignment should be written on A-4 size with, $1^{1/2}$ space and length of each question should be about 500-800 words.
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Block-1: WATER RESOURCES

1. (a)What are the characteristics of sensors used in water quality estimation.
   (b)Write the application of RS in Rainfall Runoff Modelling & Water Balance studies

2. (a) What are the parameters estimated for water quality?
   (b)What are the satellite / Sensors commonly used for snow mapping?
   (c)What is the role of RS for irrigated command area management?

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

4. (a) What is the role of remote sensing in near real time flood monitoring?
   (b) What are the currently operational EO missions for Flood disaster studies?

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

6. (a) What is the country ground Water Provinces ?
   (b) How drought assessment is done in India from Space borne data?
   (c) What are the Watershed Characteristics affecting Runoff?

Block-2: IRRIGATION, AGRICULTURE &ALLIED SECTORS

7. (a) Give a brief note on inventory of cropping pattern in irrigation systems?
   (b) How you will assess infrastructure and potential created in irrigation area?

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

9. Discuss in brief (a) Quantification of Soil Erosion Using RUSLE (b)Rainfall-Runoff Erosivity Factor (c) Soil Erodibility Factor (d) Cover-Management Factor

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

11. (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.

12. (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

13. (a) Explain the role of geo-informatics in mapping, monitoring and management of forests
    (b) Detail on the advantages and potential of hyperspectral, microwave and LiDAR remote sensing of forests

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

15. (a) Explain conventional methods of biomass assessment of forests.
    (b) Give an account of the advantages of different remote sensing techniques in quantification of spatial biomass

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

17. (a) Explain in detail on different criteria to be considered to develop a forest management information system.

    (b) What is wildlife habitat analysis? Explain different spatial and aspatial components in wildlife habitat analysis.

18.(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.

19 (a) What are invasive species and explain their ecological and economic effects.
(b) Explain in brief how remote sensing and GIS can be used in mapping and management of invasive species.

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