

IV B.Tech I Semester Regular Examinations, October/November - 2019  
**REMOTE SENSING AND GIS APPLICATIONS**  
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

*Question paper consists of Part-A and Part-B*  
*Answer ALL sub questions from Part-A*  
*Answer any FOUR questions from Part-B*  
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**PART-A** (14 Marks)

1. a) Discuss about Rayleigh scattering. [3]
- b) What are Raster bands? [2]
- c) Briefly give an account of vector data structures. [3]
- d) Discuss about vector overlay operation. [2]
- e) How can Remote sensing and GIS improve urban planning? [2]
- f) How do you apply GIS for watershed analysis and management? [2]

**PART-B** (4x14 = 56 Marks)

2. a) Describe briefly the different elements of remote sensing. [7]
- b) What are the different applications of remote sensing? State its uses. [7]
3. a) Explain the digital image processing sequence by means of a flow chart. [7]
- b) Discuss about the basic elements of image interpretation. [7]
4. a) Explain the classification of GIS operations. [7]
- b) What are the different major application areas of GIS? [7]
5. a) What is network analysis? Explain the functionality of optimal path finding with respect to shortest distance between two points. [7]
- b) Explain various arithmetic operators with examples on raster data. [7]
6. a) Discuss RS & GIS applications in land cover and land use. [7]
- b) Explain about important sensors and platforms currently used for natural resources management. [7]
7. a) Discuss steps involved in remote sensing based groundwater recharge zonation. [7]
- b) Explain advantages of using GIS in different aspects of disaster management. [7]

Code No: R1641014

**R16**

**Set No. 2**

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**PART-A (14 Marks)**

1. a) What are the sensors used in SPOT satellites? [2]
- b) What are the three digital image processing techniques? [2]
- c) How do you classify the map projections? [3]
- d) Discuss about comparison operators. [2]
- e) Explain forest biomass. How can it be determined using GIS. [2]
- f) Explain advantage of using GIS in estimation of ground water potentiality. [3]

**PART-B (4x14 = 56 Marks)**

2. a) Explain the major divisions of electromagnetic spectrum. [7]
- b) Discuss advantages and disadvantages of usage of remote sensing data. [7]
3. a) Explain the difference between supervised and unsupervised classification. [7]
- b) Discuss about preprocessing and image enhancement. [7]
4. a) List out the devices used for data input in GIS system. [7]
- b) Explain how this data input is used in map preparation. [7]
5. a) Explain in detail about buffer analysis with example and proper diagrams. [7]
- b) Differentiate between network allocation and network tracing. [7]
6. a) Explain the applications of GIS in municipal planning. [7]
- b) Enlist different application uses of Remote sensing & GIS for geology and geomorphology. [7]
7. Explain in detail procedural steps of adaptation of GIS & Remote sensing for  
(i) ground water development (ii) disaster management [14]

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1. a) What is meant by Rayleigh scattering? [2]
- b) Distinguish between spatial and non spatial data types. [3]
- c) Mention about spectral signatures in Remote sensing. [2]
- d) Discuss about the various conditional expressions. [2]
- e) How can we apply Remote sensing and GIS in agriculture? [3]
- f) Discuss flood mapping procedure with the help of GIS. [2]

**PART-B (4x14 = 56 Marks)**

2. a) Discuss in detail about  
(i) Planck's law (ii) Stephen Boltzmann law (iii) Wien's displacement law [7]
- b) What are the current IRS satellite series? Discuss their applications. [7]
3. a) Differentiate between Raster data models and vector data models. [7]
- b) Explain in detail the various digital image processing techniques. [7]
4. a) What are key components of GIS? Explain. [6]
- b) Represent the four important M's schematically, in application of GIS. [8]
5. a) Discuss the various vector overlay operations with neat diagrams and examples. [7]
- b) How do you perform overlay analysis using decision table. [7]
6. a) Explain general Remote sensing and GIS applications in agriculture and forestry. [7]
- b) Discuss the applications of GIS in municipal works. [7]
7. a) What are the advantages of using GIS in different divisions of water resources engineering? [7]
- b) How can we use GIS and Remote sensing effectively for flood zoning and mapping? [7]

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**PART-A (14 Marks)**

1. a) Explain Wien's displacement law. [2]
- b) What are the instruments used for visual image interpretation? [2]
- c) State any five applications of GIS in Civil engineering. [3]
- d) List out different arithmetic operators on vector data. [2]
- e) How can we improve study of land use and land cover with remote sensing and GIS? [2]
- f) What are Geostationary satellites? How they are used for the study of Hydrological aspects? [3]

**PART-B (4x14 = 56 Marks)**

2. a) Write down the specifications of LANDSAT-8. [7]
- b) What is electromagnetic radiation? Give a neat sketch of its spectrum and wavelength ranges? [7]
3. a) What are the instruments used for visual image interpretation and transfer of data? [7]
- b) What is the difference between supervised learning and unsupervised learning? [7]
4. a) What are the data input and output devices used in a GIS? [7]
- b) Explain about the maintenance and analysis of spatial data. [7]
5. a) Discuss various raster overlay analysis operations with neat diagram and examples. [7]
- b) Explain buffer analysis and its applications in civil engineering. [7]
6. a) Explain the Remote sensing and GIS applications in agriculture. [7]
- b) Discuss about Remote sensing applications in geology and geomorphology. [7]
7. a) How can we adopt Remote sensing for watershed management? [7]
- b) Discuss the methods of GIS useful for disaster management. [7]