# SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203.

**DEPARTMENT OF CIVIL ENGINEERING**

**QUESTION BANK**

**SUBJECT : GEOINFORMATICS APPLICATION FOR CIVIL ENGINEERS**

**SEM / YEAR : V/ III**

## UNIT – I: LAND RESOURCE MANAGEMENT

Total Station and GPS Survey – Topographic and Bathymetric Surveys – Cadastral Information – Soil and Land Use Surveys(LIS) – Real Estate Information System

## PART - A

| | | | |
|---|---|---|---|
| 1. | What is remote sensing? | BT-1 | Remembering |
| 2. | What are the measurements that can be taken using the Total station? | BT-1 | Remembering |
| 3. | What is a Map? | BT-1 | Remembering |
| 4. | Write the difference between Total station and GPS Survey. | BT-1 | Remembering |
| 5. | Define topographical survey. | BT-1 | Remembering |
| 6. | Write about Thematic Map | BT-1 | Remembering |
| 7. | What are the various conventional instruments that are used to measure the Bathymetric Survey? | BT-1 | Remembering |
| 8. | Weather Total station need Manual adjustments are not .If not what is the reason for that. | BT-1 | Remembering |
| 9. | What is geographical co- ordinate system? | BT-1 | Remembering |
| 10. | Define raster and vector data. | BT-1 | Remembering |
| 11. | Name the type of map that can be created using the topographical survey. | BT-2 | Understanding |
| 12. | What is digitizing? | BT-1 | Remembering |
| 13. | Write the difference between the Topographic and Bathymetric surveying | BT-4 | Analysis |
| 14. | Define LIS. | BT-1 | Remembering |
| 15. | List the various Land use classification in India? | BT-4 | Analysis |
| 16. | How land use is surveyed in conventional method? | BT-1 | Remembering |
| 17. | What are the advantages of Total station over Theodolite? | BT-1 | Remembering |
| 18. | List the Various uses of real estate information system. | BT-4 | Analysis |
| 19. | Define cadastral survey | BT-1 | Remembering |
| 20. | Classify the various soil types available in India? | BT-4 | Analysis |
| 21. | Define Bathymetric Survey | BT-1 | Remembering |
| 22. | Classify different type of soil based on particle size. | BT-4 | Analysis |
| 23. | List out the uses of LIS system. | BT-4 | Analysis |
| 24. | What is the use of Cadastral survey? | BT-1 | Remembering |
| 25. | What is the use of Bathymetric survey? | BT-1 | Remembering |

## PART – B

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|---|---|---|---|
| 1. | Write short notes on Total station and how to measure the readings using that. | BT-1 | Remembering |
| 2. | Explain how GPS is used to measure the details of an area? | BT-2 | understanding |
| 3. | Discuss how cadastral survey is done using GIS? | BT-6 | creating |
| 4. | Define Cadastral survey and its importance. | BT-1 | Remembering |
| 5. | What is meant by LIS and its importance in land Management? | BT-1 | Remembering |
| 6. | Briefly explain about the land use and land cover survey in conventional way. | BT-5 | Evaluating |
| 7. | Discuss how land use and land cover is mapped using GIS? | BT-6 | creating |
| 8. | How soil survey is done using conventional method? | BT-1 | Remembering |
| 9. | Explain how real estate is done in the conventional method? | BT-1 | Remembering |
| 10. | Discuss the various methods available for doing soil survey using GIS technology? | BT-6 | creating |
| 11. | How buildings are maintained under real estate information system? | BT-1 | Remembering |
| 12. | Explain briefly about the bathymetric survey. | BT-2 | understanding |
| 13. | Discuss how topographical survey is done using GIS? | BT-2 | understanding |
| 14. | Discuss how bathymetric survey is done using remote sensing? | BT-6 | creating |

## PART-C

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|---|---|---|---|
| 1. | Explain briefly how GIS is used for the Real Estate Information system? | BT-5 | Evaluating |
| 2. | Discuss how to create soil map using Remote Sensing data? | BT-6 | creating |
| 3. | Compare the conventional cadastral survey map with the LIS system . | BT-2 | Understanding |
| 4. | List the various departments in India which are taking land use and land cover survey | BT-4 | Analysis |

## UNIT – II: Structural Studies

Deformation studies of deflection - Dam deformation - structural movement - Pavement yield - shifting sand-bank and shoreline – Landslide Risk Analysis

## PART - A

| | | | |
|---|---|---|---|
| 1. | What is meant by deformation? | BT-1 | Remembering |
| 2. | What are the causes of structural deformation? | BT-1 | Remembering |
| 3. | What are the remedial measures to control structural deformation? | BT-2 | Understanding |
| 4. | What is meant by deflection? | BT-1 | Remembering |
| 5. | List out the types of dams | BT-1 | Remembering |
| 6. | What is meant by structural health monitoring system? | BT-1 | Remembering |
| 7. | How will you monitor the structural condition? | BT-3 | Applying |
| 8. | List out the reasons for dam deformation | BT-2 | Understanding |
| 9. | How will you control dam deformation? | BT-3 | Applying |
| 10. | Name the resolution about LANSAT | BT-1 | Remembering |

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| 11. | What is meant by sand bank? | BT-1 | Remembering |
| 12. | Define structural movement | BT-1 | Remembering |
| 13. | What are the factors influencing structural movement? | BT-2 | Understanding |
| 14. | Define pavement | BT-1 | Remembering |
| 15. | List out the types of pavements | BT-1 | Remembering |
| 16. | What is the difference between flexible and rigid pavements? | BT-4 | Analysing |
| 17. | What is meant by pavement yield? | BT-1 | Remembering |
| 18. | What are the factors influencing the strength of the pavement? | BT-2 | Understanding |
| 19. | What is meant by shifting of sand bank/ shoreline? | BT-1 | Remembering |
| 20. | List out the factors which influence in shifting the shoreline | BT-2 | Understanding |
| 21. | What are the forces acting on dam? | BT-2 | Understanding |
| 22. | What is meant by landslide? | BT-1 | Remembering |
| 23. | What are the causes for landslide? | BT-2 | Understanding |
| 24. | How will you analyse the landslide risk? | BT-4 | Analysing |
| 25. | List out the satellites which give information about land risk | BT-2 | Understanding |

## PART – B

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|---|---|---|---|
| 1. | What is meant by deformation? List out the causes for deformation and explain in detail | BT-2 | Understanding |
| 2. | Explain about structural health monitoring in detail | BT-1 | Remembering |
| 3. | Discuss about the role of GIS in structural deflection studies | BT-3 | Applying |
| 4. | What are the types of dam and explain the forces acting on it. | BT-1 | Remembering |
| 5. | Explain in detail about the factors influencing dam deformation | BT-2 | Understanding |
| 6. | How will you control dam deformation with the help of GIS? | BT-3 | Applying |
| 7. | What are the types of pavement and explain them in detail. | BT-1 | Remembering |
| 8. | What are the factors influencing pavement yield and explain them in detail | BT-1 | Remembering |
| 9. | How GIS mapping is done to monitor the pavement yield? | BT-4 | Analyzing |
| 10. | What is meant by shifting of sand bank shoreline and explain in detail | BT-1 | Remembering |
| 11. | How will you study the pattern of shoreline shifting using GIS? | BT-4 | Analyzing |
| 12. | What is meant by landslide? Explain about the factors influencing it in detail | BT-1 | Remembering |
| 13. | Explain in detail about the effect of landslide | BT-2 | Understanding |
| 14. | Discuss in detail about the application of GIS in landslide risk analysis | BT-4 | Analyzing |

## PART-C

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|---|---|---|---|
| 1. | What is meant by structural deflection? With the application of GIS, how will you control its effects? Explain the process in detail. | BT-2 | Understanding |
| 2. | Explain in detail about the geoinformatics application in monitoring the pavement yield | BT-3 | Applying |
| 3. | Define shoreline shifting and what are the factors influencing it? With the help of GIS, how will you map the trend of shoreline shifting? | BT-4 | Analysing |
| 4. | Discuss about the role of GIS in landslide risk analysis with a case study. | BT-5 | Creating |

## UNIT – III: Soil Conservation and Management

Soil survey interpretation and mapping - impact of agricultural and industrial activity on soil properties - soil erosion - factors influencing soil erosion - soil contamination using Hyper spectral Remote Sensing - mining pollution- EMR responses with contaminated soil - modeling soil characteristics using satellite data - soil degradation assessment using Remote Sensing and GIS - Land reclamation studies

## PART - A

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| 1. | Write the importance of soil survey? | BT-2 | Understanding |
| 2. | Define soil erosion | BT-1 | Remembering |
| 3. | List down the factors influencing soil erosion | BT-2 | Understanding |
| 4. | What is land reclamation? | BT-1 | Remembering |
| 5. | Define soil contamination | BT-1 | Remembering |
| 6. | What are the types of soil contamination? | BT-1 | Remembering |
| 7. | Explain how soil contamination affects the environment. | BT-3 | Applying |
| 8. | What are the sources of soil contamination? | BT-2 | Understanding |
| 9. | Write the impacts of agricultural activities on soil properties | BT-2 | Understanding |
| 10. | List down the 7 important characteristics of soil | BT-1 | Remembering |
| 11. | What is soil survey? | BT-1 | Remembering |
| 12. | Where can we get information regarding soil survey? | BT-3 | Applying |
| 13. | Define soil degradation | BT-1 | Remembering |
| 14. | Name some satellites used for soil degradation assessment | BT-4 | Analysing |
| 15. | What is hyperspectral remote sensing? | BT-1 | Remembering |
| 16. | Write down the impacts of industrial activities on soil properties | BT-4 | Analysing |
| 17. | What are the methods of land reclamation? | BT-1 | Remembering |
| 18. | List out the types of land reclamation | BT-1 | Remembering |
| 19. | Define soil mapping | BT-1 | Remembering |
| 20. | List down the steps involved in soil survey | BT-1 | Remembering |
| 21. | Write the difference between hyperspectral and multispectral remote sensing | BT-4 | Analysing |
| 22. | Define EMR | BT-1 | Remembering |
| 23. | What are the data collected during soil survey? | BT-3 | Applying |
| 24. | List down the steps in land reclamation | BT-2 | Understanding |
| 25. | What are the causes of soil erosion? | BT-2 | Understanding |

## PART – B

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|---|---|---|---|
| 1. | How will you assess the impact of mining on land and water? | BT-3 | Applying |
| 2. | Explain EMR responses with contaminated soil | BT-2 | Understanding |
| 3. | How will you model soil characteristics using satellite data? | BT-3 | Applying |
| 4. | Write notes on geoinformatics application on land reclamation studies | BT-1 | Remembering |
| 5. | Explain in detail about the steps in soil survey programme | BT-2 | Understanding |

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| 6. | What are the kinds of soil survey? | BT-1 | Remembering |
| 7. | Write down the impact of agricultural and industrial activities on soil properties | BT-2 | Understanding |
| 8. | Explain soil erosion and factors influencing it | BT-1 | Remembering |
| 9. | Explain mining pollution and its impact on environment | BT-1 | Remembering |
| 10. | Define soil contamination and explain the types of soil contamination | BT-1 | Remembering |
| 11. | What is soil survey and write down its importance | BT-2 | Understanding |
| 12. | Explain hyperspectral remote sensing in detail | BT-1 | Remembering |
| 13. | Brief out the steps involved in soil survey | BT-3 | Applying |
| 14. | What are the advantages and disadvantages of using hyperspectral imaging over multispectral imaging? | BT-4 | Analyzing |

**PART-C**

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|---|---|---|---|
| 1. | What are the data collected during soil survey and explain the role of GIS with collected data | BT-2 | Understanding |
| 2. | What are the reclamation steps to be done to improve the soil fertility with the help of GIS soil mapping? | BT-3 | Applying |
| 3. | List out the data to be collected to identify the area affected by soil erosion and how will you execute it using GIS? | BT-4 | Analysing |
| 4. | Explain the factors influencing soil erosion in detail | BT-1 | Remembering |

## UNIT – IV: Urban and Transport Management

Monitoring Urban Growth through Remote Sensing - Geo-demographic Analysis – Property Market Analysis Urban Renewal - traffic analysis - accident analysis - site suitability analysis for transport infrastructure – transportation databases: creation and maintenance - Vehicle routing – Highway maintenance system – Intelligent Transportation System

## PART – A

| | | | |
|---|---|---|---|
| 1 | Define Urban Growth. | BT-1 | Remembering |
| 2 | What are the factors influencing population growth? | BT -2 | Understanding |
| 3 | What are the advantages and disadvantages of urban growth? | BT -2 | Understanding |
| 4 | Define Geo demography | BT-1 | Remembering |
| 5 | List out the data to be collected for Geo demography analysis. | BT -4 | Analysing |
| 6 | Write about property market analysis. | BT-1 | Remembering |
| 7 | What are the causes for a road accident? | BT -4 | Analysing |
| 8 | List out the details to be collected for traffic analysis. | BT -4 | Analysing |
| 9 | Discuss about the factors influencing on site suitability for transport infrastructure. | BT -4 | Analysing |
| 10 | What do you mean by transportation database? | BT -2 | Understanding |
| 11 | How will you maintain the transportation effectively? | BT-3 | Applying |
| 12 | What do you mean by pot holes? | BT -2 | Understanding |

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| 13 | Write any 5 causes of road failures. | BT -2 | Understanding |
| 14 | How will you take survey about the traffic loading? | BT-3 | Applying |
| 15 | Define Vehicle Routing | BT-1 | Remembering |
| 16 | What is meant by intelligent transportation system? | BT -2 | Understanding |
| 17 | Enlist the steps to be taken for highway maintenance. | BT -4 | Analysing |
| 18 | How will you relate remote sensing with transportation management system? | BT-3 | Applying |
| 19 | Name some high resolution satellite used for Urban Planning and transportation. | BT-1 | Remembering |
| 20 | Write any 3 steps to minimize road accidents | BT -4 | Analysing |
| 21. | What are the effects of urban growth on environment? | BT -2 | Understanding |
| 22. | Write the importance of traffic analysis | BT -2 | Understanding |
| 23. | What are the steps to control road accident? | BT-3 | Applying |
| 24. | List down the steps involved in accident analysis. | BT-3 | Applying |
| 25. | What are the types of transportation? | BT-1 | Remembering |

## PART B

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|---|---|---|---|
| 1 | What is meant by urban growth .Explain in detail about the factors influencing urban growth. | BT -2 | Understanding |
| 2 | How will you monitor urban growth with the help of Remote Sensing? | BT-3 | Applying |
| 3 | What are the data to be collected for urban growth monitoring and how will you do GIS mapping with the above collected data | BT -2 | Understanding |
| 4 | Explain in detail about the role of GIS in geo-demographic analysis. | BT-3 | Applying |
| 5 | How will you do property market analysis with the help of GIS application? | BT -2 | Understanding |
| 6 | Why traffic analysis is necessary? Explain the analysis procedure in detail | BT -4 | Analysing |
| 7 | What are the data needed to do traffic analysis? what necessary steps you will take to collect them. | BT -4 | Analysing |
| 8 | Explain in detail about the causes of road accidents and what remedial measures you will take to control them? | BT -4 | Analysing |
| 9 | Explain the steps involved in accident analysis. | BT-5 | Evaluate |
| 10 | As a Civil Engineer, How will you select a site a for transportation infrastructure? | BT-3 | Applying |
| 11 | Explain in detail about the types of transportation. | BT-1 | Remembering |
| 12 | What is meant by transportation database and how you will create with the help of GIS | BT-6 | Create |
| 13 | What is meant by Vehicle routing. How will you implement that efficiently? | BT-6 | Create |
| 14 | Discuss about intelligent transportation system | BT -2 | Understanding |

## PART – C

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|---|---|---|---|
| 1 | i)What is meant by traffic analysis? What are the data to be collected to execute that.<br>ii) With the help of Remote Sensing and GIS, how will you analyse the traffic scenario | BT -4 | Analysing |

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| 2 | Explain in detail about the step by step procedure involved in urban growth monitoring system | BT-3 | Applying |
| 3 | i)Why there is a need for creating transportation database.<br>ii)how will you create and maintain transportation database with the help of Remote Sensing and GIS? | BT-6 | Create |
| 4 | Explain in detail about intelligent transportation system with a case study | BT-5 | Evaluate |

## UNIT – V: Water Resources Planning and Management

Location of storage/diversion works – capacity curve generation – sediment yield - modelling of catchments – Delineation of watershed - Watershed modelling for sustainable development - Rainfall – Runoff modelling – LiDAR Mapping for Urban area –Water quality mapping and monitoring – Flood Risk Zoning - Flood damage assessment – Flood Modelling - Assessment of droughts and mitigation

## PART – A

| | | | |
|---|---|---|---|
| 1 | Define Diversion works | BT-1 | Remembering |
| 2 | What are the different types of diversion Structures? | BT-1 | Remembering |
| 3 | Define capacity curve. | BT-1 | Remembering |
| 4 | Explain how capacity curve is generated? | BT-2 | understanding |
| 5 | Explain Sediment yield. | BT-2 | understanding |
| 6 | Define Modelling. | BT-1 | Remembering |
| 7 | List the various types of model available for the catchment analysis? | BT-4 | Analysis |
| 8 | Define Watershed. | BT-1 | Remembering |
| 9 | Explain how to delineate a watershed? | BT-2 | understanding |
| 10 | Define Sustainable development. | BT-1 | Remembering |
| 11 | Why sustainable development is need in the watershed model? | BT-1 | Remembering |
| 12 | Explain the between relationship for rainfall and runoff. | BT-2 | understanding |
| 13 | List the various empirical formulas available for the rainfall and runoff analysis? | BT-4 | Analysis |
| 14 | Define LiDAR. | BT-1 | Remembering |
| 15 | Discuss how water quality is mapped using the GIS technology? | BT-6 | Creating |
| 16 | What are the ways to monitor the water quality? | BT-1 | Remembering |
| 17 | Define flood. | BT-1 | Remembering |
| 18 | What are the various types of flood? | BT-1 | Remembering |
| 19 | Define Drought. | BT-1 | Remembering |
| 20 | Define damage Assessment. | BT-1 | Remembering |
| 21 | How sediment yield is Estimated? | BT-1 | Remembering |
| 22 | What are the various types of drought? | BT-1 | Remembering |
| 23 | Difference between Hydrologic and Agricultural drought. | BT-1 | Remembering |
| 24 | Define meteorological drought. | BT-1 | Remembering |
| 25 | What is meant by flood risk zoning? | BT-1 | Remembering |

## PART-B

| | | | |
|---|---|---|---|
| 1 | Explain how watershed is delineated using the GIS software? | BT-2 | understanding |
| 2 | List various Empirical formulas which give the relationship between the Rainfall and Runoff? | BT-4 | Analysis |
| 3 | Explain briefly about the various rainfall and runoff models? | BT-2 | understanding |
| 4 | Explain briefly how watershed is modelled for the sustainable development? | BT-2 | understanding |
| 5 | Discuss how LiDAR is used to map the Urban area and what are its advantages? | BT-6 | Creating |
| 6. | Discuss how water quality is mapped and monitor using the GIs technology? | BT-6 | Creating |
| 7 | Explain briefly about various steps to be carried out to locate the Storage /Diversion structures? | BT-2 | understanding |
| 8 | Discuss how Capacity curve drawn for a reservoir using the Arc GIS ? | BT-6 | Creating |
| 9 | Define Sediment yield and how sediment yield is calculated? | BT-1 | Remembering |
| 10 | Estimate the Sediment yield using the GIS technology. | BT-6 | Creating |
| 11 | Estimate flood risk zoning using the GIS technology. | BT-6 | Creating |
| 12 | How flood damage is assessment is done in the conventional way? | BT-1 | Remembering |
| 13 | List the various methods available for the Drought assessment? | BT-4 | Analysis |
| 14 | Explain briefly about long term Drought mitigation measures? | BT-2 | understanding |

## PART – C

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|---|---|---|---|
| 1. | Estimate the rainfall –runoff using a Hydrological model. | BT-6 | Creating |
| 2. | Discuss how water quality Mapping is Done using the ArcGIS software? | BT-6 | Creating |
| 3. | Explain briefly how flood damage assessment is done using the remote sensing. | BT-2 | understanding |
| 4. | How drought Assessment is done using the Hydrological and Agricultural point of view? | BT-1 | Remembering |