SRM VALLIAMMAI ENGINEERING COLLEGE
(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

IV SEMESTER

1903408 –GEOMATICS APPLICATIONS FOR CIVIL ENGINEERS

Regulation – 2019
Academic Year 2021 – 2022

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SUBJECT : GEOMATICS APPLICATIONS FOR CIVIL ENGINEERS

SEM / YEAR: IV/ II

UNIT – I: INTRODUCTION OF REMOTE SENSING AND GIS

Definition of remote sensing and its components – Electromagnetic spectrum – wavelength regions important to remote sensing – Wave theory, Particle theory. Types of platforms – orbit types, Sun-synchronous and Geosynchronous – Passive and Active -Sensors. Meteorological satellites – Airborne and space borne TIR and microwave sensors.

PART - A

1.	What is remote sensing?	BT-1	Remembering
2.	What are all the application of remote sensing?	BT-1	Remembering
3.	What are the components of remote sensing?	BT-1	Remembering
4.	What is electromagnetic radiation?	BT-1	Remembering
5.	What are the types of scattering?	BT-1	Remembering
6.	What is passive sensor?	BT-2	Understanding
7.	Write the advantages of active sensor.	BT-1	Remembering
8.	What are the types of platforms?	BT-1	Remembering
9.	What is resolution?	BT-1	Remembering
10.	What are the elements of resolution?	BT-1	Remembering
11.	Name the different type of electromagnetic radiation.	BT-2	Understanding
12.	Write about refraction.	BT-1	Remembering
13.	Difference geostationary orbit and polar sun synchronous orbit.	BT-4	Analysis
14.	Write short note on temporal resolution.	BT-1	Remembering
15.	Write types of micro wave sensor	BT-1	Remembering
16.	Write Stefan Boltzmann law?	BT-1	Remembering
17.	What is emissivity?	BT-1	Remembering
18.	Write wein's displacement law?	BT-2	Understanding
19.	Write short notes on spatial resolution.	BT-1	Remembering
20.	Classify the various type of data products.	BT-4	Analysis
21.	Define Atmospheric window?	BT-2	Understanding
22.	Write the difference between spectral and spatial resolution.	BT-4	Analysis
23.	Draw the wave model.	BT-1	Remembering
24.	What is RADAR?	BT-1	Remembering
25.	Discuss the quantum theory interaction.	BT-6	Creating

PART – B

1.	Define about the Atmospheric Window and Atmospheric Scattering.	BT-1	Remembering
2.	Briefly Explain in detail about the energy interaction with Atmosphere and Earth resources.	BT-5	Evaluating
3.	Describe the elements of Remote Sensing.	BT-1	Remembering
4.	Explain in detail about the remote sensing components.	BT-2	Understanding
5.	Define the following theory (i) particle theory ii) stefen Boltzmann theory iii) wein's Displacement law.	BT-1	Remembering
6.	What are the different types of platforms related to Remote Sensing?	BT-1	Remembering
7.	Briefly explain about Various image Classification method.	BT-5	Evaluating
8.	Explain in detail about the different types of sensor based on orbit, energy source and data capture.	BT-2	Understanding
9.	Explain in detail about the Airborne and space bar TIR and Microwave sensor.	BT-2	Understanding
10.	Explain briefly about the concept of resolution and its importance.	BT-2	Understanding
11.	Explain briefly about the earth resource and weather satellite.	BT-2	Understanding
12.	Explain briefly about the advantages and limitation of Remote sensing.	BT-2	Understanding
13.	Briefly Explain about the elements of visual interpretation techniques.	BT-5	Evaluating
14.	Explain the terms (i) Raman Scattering (ii) Non-selective scattering (iii) Refraction (iv) Reflection.	BT-2	Understanding

PART-C

1.	Explain in detail spectral reflectance of vegetation, water and soil.	BT-2	Understanding
2.	Briefly explain in details about the EMS and wavelength regions important to remote Sensing	BT-5	Evaluating
3.	Explain briefly about the about the Sun-synchronous and Geosynchronous satellite.	BT-2	Understanding
4.	Briefly explain about earth resource and weather satellites	BT-5	Evaluating

UNIT – II: GIS CONCEPT

Introduction – Maps – Definitions – Map projections – types of map projections – map analysis – GIS definition – basic components of GIS – standard GIS softwares – Data type – Spatial and non spatial (attribute) data – measurement scales – Data Base Management Systems (DBMS).

PART - A

1.	What is image interpretation?	BT-1	Remembering
2.	What are all the types of image interpretation?	BT-1	Remembering
3.	What is visual image interpretation?	BT-1	Remembering
4.	What is map?	BT-1	Remembering
5.	Write about topographical map?	BT-1	Remembering
6.	List out the different types of maps.	BT-2	Understanding
7.	What is geographic Co-ordinate system?	BT-1	Remembering
8.	List out the types of Map Projection used.	BT-2	Understanding

9.	Write few lines about conical projection.	BT-1	Remembering
10.	What is QTM?	BT-1	Remembering
11.	What are the methods of spatial referencing Systems?	BT-1	Remembering
12.	What are the components of GIS?	BT-1	Remembering
13.	What is data model?	BT-1	Remembering
14.	Difference between the vector and raster.	BT-1	Remembering
15.	What is cell center?	BT-1	Remembering
16.	Define digitizing.	BT-2	Understanding
17.	List out the various GIS software	BT-1	Remembering
18.	What are the characteristics of map?	BT-1	Remembering
19.	Write few lines about azimuthal projection?	BT-1	Remembering
20.	Define GIS.	BT-2	Understanding
21.	What is scanning?	BT-2	Understanding
22.	What is Dominant Area?	BT-1	Remembering
23.	What is raster Coding?	BT-1	Remembering
24.	Different methods of data input.	BT-4	Analysing
25.	List out the error in digitizing	BT-4	Analysing

PART – B

1.	Explain briefly about the various components of GIS.	BT-1	Remembering
2.	Briefly explain about the different types of map Projection.	BT-5	Creating
3.	Explain briefly about the GIS data base management system.	BT-1	Remembering
4.	Explain briefly about the methods of integrated data analysis.	BT-1	Remembering
5.	Briefly explain about the methods of attribute data analysis	BT-5	Creating
6.	Explain the term GIS. What are the applications of GIS?	BT-1	Remembering
7.	Explain the terms (i) Field based raster model (ii) object based raster model.	BT-1	Remembering
8.	What do you mean by Vector overlay? Explain Point-in-polygon overlay, Lineon-polygon overlay, Polygon-on-polygon overlay.	BT-2	Understanding
9.	Write the difference between the spatial and non-spatial data.	BT-4	Analyzing
10.	Explain briefly about the different measurement scales.	BT-1	Remembering
11.	Briefly explain about the two data models in the GIS.	BT-5	Creating
12.	Explain the various methods of raster data compression with neat sketches.	BT-1	Remembering
13.	Describe the various methods of database management system with a typical example.	BT-6	Creating
14.	Explain briefly about the UTM Projection System.	BT-1	Remembering

PART-C

1.	What are raster data models and vector data models? Write the basic differences between raster and vector data models.	BT-2	Understanding
2.	What do you understand by spatial data and how are they integrated to make a GIS?	BT-2	Understanding
3.	Briefly explain about the map analysis in GIS.	BT-5	Creating
4.	Explain the basic hardware components and software modules of GIS with neat sketches.	BT-1	Remembering

UNIT – III: LAND RESOURCE AND SOIL CONSERVATION MANAGEMENT

Topographic and Bathymetric Surveys – Cadastral Information –Soil and Land Use Surveys - Land Information System (LIS) – Real Estate Information System- Soil survey interpretation and mapping - impact of agricultural and industrial activity on soil properties - modeling soil characteristics using satellite data - soil degradation assessment using Remote Sensing and GIS.

PART - A

1.	List out the uses of LIS system.	BT-4	Analysis
2.	List the Various uses of real estate information system.	BT-4	Analysis
3.	Define cadastral survey.	BT-1	Remembering
4.	Define Bathymetric Survey.	BT-1	Remembering
5.	List the various Land use classification in India?	BT-4	Analysis
6.	Name the type of map that can be created using the topographical survey.	BT-2	Understanding
7.	Define LIS.	BT-1	Remembering
8.	How land use is surveyed in conventional method?	BT-1	Remembering
9.	Write the impacts of agricultural activities on soil properties.	BT-2	Understanding
10.	Explain how soil contamination affects the environment.	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.	Define Topographic survey.	BT-1	Remembering
16.	Write down the impacts of industrial activities on soil properties.	BT-4	Analysing
17.	What are the data required to model soil characteristics?	BT-1	Remembering
18.	What are the advantages of LIS?	BT-1	Remembering
19.	Define soil mapping.	BT-1	Remembering
20.	List down the steps involved in soil survey.	BT-1	Remembering
21.	List out the data in cadastral information.	BT-4	Analysing
22.	Give the steps involved in soil mapping.	BT-1	Remembering
23.	What are the data collected during soil survey?	BT-3	Applying
24.	Enumerate the applications of soil survey.	BT-2	Understanding
25.	What are the causes of soil erosion?	BT-2	Understanding

PART – B

1.	How will you assess the impact of mining on land and water?	BT-3	Applying
2.	Elaborate the procedure behind landuse survey.	BT-2	Understanding
3.	How will you model soil characteristics using satellite data?	BT-3	Applying
4.	Give your views on soil conservation management.	BT-6	Creating
5.	Explain in detail about the steps in soil survey programme.	BT-2	Understanding

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.	Explain the steps involved in soil mapping.	BT-1	Remembering
11.	What is soil survey and write down its importance? Brief out the steps involved in soil survey.	BT-2	Understanding
12.	Explain Real Estate Information system.	BT-3	Applying
13.	What is meant by LIS and its importance in land Management?	BT-1	Remembering
14.	Explain how real estate is done in the conventional method.	BT-1	Remembering

PART-C

1.	What are the data collected during soil survey and explain the role of GIS with collected data	BT-2	Understanding
2.	Compare the conventional cadastral survey map with the LIS system.	BT-2	Understanding
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 briefly how GIS is used for the Real Estate Information system?	BT-5	Evaluating

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

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

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	Evaluating
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	Creating
13	What is meant by Vehicle routing. How will you implement that efficiently?	BT-6	Creating
14	Discuss about intelligent transportation system	BT -2	Understanding

PART – C

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

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? ii) How will you create and maintain transportation database with the help of Remote Sensing and GIS?	BT-6	Creating
4	Explain in detail about intelligent transportation system with a case study.	BT-5	Evaluating

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

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