



SRM VALLIAMMAI ENGINEERING COLLEGE
SRM Nagar, Kattankulathur – 603203.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

SUBJECT: OCE552-Geographic Information System

SEM / YEAR: V / III

UNIT-1	
Introduction to GIS – Basic spatial concepts – Coordinate Systems – GIS and Information Systems – Definitions – History of GIS – Components of a GIS – Hardware, Software, Data, People, Methods – Proprietary and open source Software – Types of data – Spatial, Attribute data.types of attributes – scales/ levels of measurements.	

PART A

S. No.	Question	BTL	Competence
1	What is datum?	BTL -1	Remember
2	Define GIS.	BTL -1	Remember
3	Describe the key components of a GIS	BTL -5	Understand
4	What is data model?	BTL -1	Remember
5	State the characteristics of GIS.	BTL -1	Remember
6	What is geographic coordinate system?	BTL -4	Analyze
7	Summarize the main characteristics of spatial data.	BTL -4	Understand
8	Define topology.	BTL -1	Remember
9	Evaluate the outcome of map projection and define what Map projections is.	BTL -2	Analyze
10	Pointout the difference between data and information.	BTL -4	Analyze
11	Illustrate the azimuthal Projection.	BTL -3	Apply
12	Compose how GIS handles the attribute data.	BTL -6	Create
13	Illustrate with example the Commercial and Free and Open Source GIS Packages.	BTL -3	Apply
14	Examine the commonly Used Map Projections.	BTL -3	Apply
15	Generalize Datum Accuracy.	BTL -6	Create
16	Differentiate between plan and map.	BTL -2	Understand
17	Differentiate raster and vector data.	BTL -2	Evaluate
18	Explain the difference between the spatial and non spatial data.	BTL -5	Evaluate
19	Tabulate few applications of GIS.	BTL -1	Remember
20	Discuss the difference between the georelational data model and the object-based data model.	BTL -2	Understand

Part B

1	i) Define map Projection. Discuss the various types of map projection. (7)	BTL -1	Remember
	ii) Describe in detail the various components of GIS. (6)		
2	i) Briefly discuss about the geographic coordinate systems.(7)	BTL -2	Understand
	ii) Describe about datum and datum accuracy. (6)		
3	i) Illustrate with an example the spatial and attribute data type.(7)	BTL -3	Apply
	ii) Examine the influence of maps on the character of spatial.(6)		
4	Differentiate NAD27 and NAD83(13)	BTL -2	Understand
5	i) Describe in detail the various application of GIS. (7)	BTL -1	Remember
	ii) Describe in detail the history of GIS.(6)		
6	Discuss the elements of GIS. (13)	BTL -2	Understand
7	Illustrate with example :	BTL-3	Apply
	i) Transverse Mercator. (7) ii) Lambert Conformal Conic.(6)		
8	Analyze the following	BTL -4	Analyze
	i) Albers Equal-Area Conic.(7) ii) Web Mercator.(6)		
9	i) Define BLOB. (7)	BTL -1	Remember
	ii) Identify the various types of attribute data.(6)		
10	Develop a projected coordinate systems.(13)	BTL -6	Create
11	Explain in detail about Projection File and Predefined coordinate Systems with an example.(13)	BTL -5	Evaluate
12	Analyze the following	BTL -4	Analyze
	(i)Scale(5) (ii)Lines (4) (iii)Areas (4)		
13	i) Examine how to Measure Distances on the Earth's Surface.(7)	BTL -1	Remember
	ii) Describe On-the-Fly Projection. (6)		
14	Explain the various levels of measurement in gis. (13)	BTL -4	Analyze

Part-C

1	Pointout how the data sets are analyzed by the TIGER/Line file with an example.(15)	BTL -4	Analyze
2	Compose the application of coordinate that covers the projection and reprojection .(15)	BTL6	Create
3	Summarize an example from your discipline in which a GIS can provide useful tools for building a model.(15)	BTL5	Evaluate
4	(i) Generalize any two examples of vector data analysis.(8) (ii) Generalize any two examples of raster data analysis. (7)	BTL6	Create

UNIT II

SPATIAL DATA MODELS Database Structures – Relational, Object Oriented – Entities – ER diagram – data models conceptual, logical and physical models – spatial data models – Raster Data Structures – Raster Data Compression – Vector Data Structures – Raster vs Vector Models- TIN and GRID data models.

PART A

S. No.	Question	BTL	Competence
1	Define Spatial Data Model.	BTL -1	Remember
2	Define georelational data model.	BTL -1	Remember
3	Discriminate the three basic topological relationships of georelational data models.	BTL -5	Evaluate
4	What is Digital Raster Graphics?	BTL -1	Remember
5	Define object-based data model.	BTL -1	Remember
6	Compare the raster and vector data structures.	BTL -4	Analyze
7	Pointout how objects are managed in GIS.	BTL -4	Analyze
8	Define Entity.	BTL -1	Remember
9	Discuss raster data compression.	BTL -2	Understand
10	Differentiate the three methods of raster data structures.	BTL -4	Analyze
11	Show the regional quad tree method that divides raster into a hierarchy of quadrants.	BTL -3	Apply
12	Develop the data structure for the line and point coverage.	BTL -6	Create
13	Illustrate surface entity.	BTL -3	Apply
14	Show the topological structuring of complex areas.	BTL -3	Apply
15	Compose the elements of the raster Data model.	BTL -6	Create
16	Discuss how the data structures are classified based on the data.	BTL -2	Understand
17	Distinguish georelational data model and the object-based data Model.	BTL -2	Understand
18	Summarize raster data model.	BTL -5	Evaluate
19	Describe Digital Orthophotos.	BTL -1	Remember
20	Discuss how all the geographical phenomenon can be represented by three main entities.	BTL -2	Understand

Part B

1	i)Describe the georelational data model.(7)	BTL -1	Remember
	ii)Describe the datastructure for representing the data model such as geodatabase (6)		
2	i)Explain the object oriented data model(7)	BTL -4	Analyze
	ii)Explain how the software developers organize classes.(6)		
3	i)Examine how the raster data are divided.(7)	BTL -3	Apply
	ii)Illustrate with an example the elements of the rasterData model.(6)		
4	Summarize the various digital elevation models(13)	BTL -2	Understand
5	i)Define and describe the triangulated irregular network (TIN).(7)	BTL -1	Remember
	ii)Examine how TIN is constructed.(6)		
6	Describe the following raster data structure (i) Cell-by-Cell Encoding (5) (ii) Run-Length Encoding(4) (iii)Quadtree(4)	BTL -2	Understand
7	Summarize raster data compression.(13)	BTL -5	Evaluate
8	Compare the advantages and disadvantages of the raster data model versus the vector data model..(13)	BTL -4	Analyze
9	i)Examine the GIs data standards.(7)	BTL -1	Remember
	ii)Describe the GML proposed by OGC.(6)		
10	Demonstrate the GRID model of GIS with necessary diagram.(13)	BTL -3	Apply
11	Explain how the spatial entities are used to create a data model.(13)	BTL -4	Analyze
12	Describe the following (i)Block Coding.(7) (ii)Chain coding . (6)	BTL -1	Remember
13	Discuss the methods for identifying surface significant points.(13)	BTL -2	Understand
14	Design the diagram of how geodatabase organizes vector data sets.(13)	BTL -6	Create

PART-C

1	Infer the steps of the application of raster data model. (15)	BTL -4	Analyze
2	(i) Create a data structure of a region subclass .(8) (ii) Create a data structure of a route subclass. (7)	BTL6	Create
3	Deduce the steps of the application of vector data model. (15)	BTL5	Evaluate
4	Generalize how the raster and vector approaches are used to construct point, line and area entities for representation in the computer. (15)	BTL6	Create

UNIT III

DATA INPUT AND TOPOLOGY Scanner – Raster Data Input – Raster Data File Formats – Georeferencing – Vector Data Input –Digitiser – Datum Projection and reprojection -Coordinate Transformation – Topology – Adjacency, connectivity and containment – Topological Consistency – Non topological file formats – Attribute Data linking –Linking External Databases – GPS Data Integration

PART A

S. No.	Question	BTL	Competence
1	Define scanning.	BTL -1	Remember
2	Describe the advantages of scanning using scanner	BTL -1	Remember
3	Summarize the few possible encoding methods for different data sources.	BTL -5	Evaluate
4	Examine the term topology.	BTL -1	Remember
5	Classify the topology in spatial data.	BTL -3	Apply
6	Analyze the thematic data of spatial data.	BTL -4	Analyze
7	Pointout the traditional methods of surveying techniques.	BTL -4	Analyze
8	What is topological errors?	BTL -1	Remember
9	Differentiate the point and stream mode digitizing	BTL -2	Understand
10	Analyze the classified vector data input.	BTL -4	Analyze
11	Show how the spatial and attribute data is linked in Gis.	BTL -3	Apply
12	Generalize common raster formats.	BTL -6	Create
13	Examine why the scanning method for digitizing involves both rasterization and vectorization.?	BTL -1	Remember
14	Illustrate pseudonode.	BTL -3	Apply
15	Compose the raster data input.	BTL -6	Create
16	Differentiate Bezier curves and splines.	BTL -2	Understand
17	Discuss the Criteria for Choosing Modes of Input.	BTL -2	Understand

18	Explain Dangling nodes.	BTL -5	Evaluate
19	Define ODBC.	BTL -1	Remember
20	Describe the difference between on-screen digitizing and tablet digitizing.	BTL -2	Understand

Part B

1	Define ODBC .How applications are connected to the database through odbc(13)	BTL -1	Remember
2	i)Explain in detail the various methods of data input(7)	BTL -5	Evaluate
	ii)Explain the possible encoding methods for different data sources.(6)		
3	i)Illustrate what is a scanner(3)	BTL -3	Apply
	ii)Illustrate with example the three different types of scanner.(10)		
4	Discuss in detail (i)Topology(4) (ii)Adjacency(3) (iii)Containment(3) (iv)Connectivity(3)	BTL -2	Understand
5	i)Describe in detail the thematic characteristics of spatial data.(7)	BTL -1	Remember
	ii)Describe the scale of measurement with respect to spatial data(6)		
6	Describe how data are collected using satellite navigation system or GPS. (13)	BTL -2	Understand
7	Give the standards of for spatial data with example.(13)	BTL -2	Understand
8	i)Point out the topological consistency rules.(7) ii)Explain the Criteria for Choosing Modes of Input.(6)	BTL -4	Analyze
9	Describe the three basic steps in using a topology rule(13)	BTL -1	Remember
10	Explain how the spatial and attribute data are linked (13)	BTL -4	Analyze
11	i)Analyze how GPS is used to collect Geospatial data(7)	BTL -4	Analyze
	ii)Explain with an example GPS based mapping.(6)		
12	i)Describe how to represent data using raster model and vector model(7)	BTL -1	Remember
	ii)Examine the File Formats for Raster Spatial Data(6)		
13	i>Show the Rasterization of Digitized Data(7) ii)Demonstrate the File Formats of Vector Spatial data(6)	BTL -3	Apply

14	Develop Vectorization of Scanned Images(13)	BTL -6	Create
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PART-C

1	Explain how to reproject a raster data.(15)	BTL -4	Analyze
2	Summarize how to project a geographic data to a projected coordinate system.(15)	BTL5	Evaluate
3	Generalize ArcGIS 8 Database Environment(15)	BTL6	Create
4	Develop ArcGIS Raster File Formats(15)	BTL6	Create

UNIT IV

Vector Data Analysis tools - Data Analysis tools - Network Analysis - Digital Education models - 3D data collection and utilisation.

PART A

S. No.	Question	BTL	Competence
1	List the tools for vector data analysis.	BTL -1	Remember
2	Examine how buffering creates area.	BTL -1	Remember
3	Summarize few applications of Buffering.	BTL -5	Understand
4	List out the overlay methods.	BTL -1	Remember
5	Tabulate the difference between the point-in-polygon overlay and line-in-polygon overlay.	BTL -1	Remember
6	Pointout what is vector data analysis.	BTL -4	Analyze
7	Discuss the four basic rules followed in overlay.	BTL -4	Understand
8	Describe the three variations in buffering	BTL -1	Remember
9	Analyze the nearest neighbor in point pattern analysis.	BTL -2	Analyze
10	Explain what is silver.	BTL -4	Analyze
11	Illustrate the buffer zone.	BTL -3	Apply
12	Compose Spatial Autocorrelation.	BTL -6	Create
13	Demonstrate Ripley's K-function.	BTL -3	Apply
14	Show with an example about least-cost path analysis and shortest path analysis	BTL -3	Apply
15	Design network and network analysis	BTL -6	Create
16	Compare and Contrast the Dissolve,clip and eliminate.	BTL -2	Understand
17	Discuss the Applications of Pattern Analysis	BTL -2	Evaluate
18	Explain the update and erase in feature manipulation.	BTL -5	Evaluate
19	Define the three types of inlays	BTL -1	Remember
20	give the restrictions in network analysis?	BTL -2	Understand

Part B

1	Briefly describe the following i) Buffering.(7) ii) Vector overlay(6)	BTL -1	Remember
2	i) Explain the error propagation in overlay(7)	BTL -5	Evaluate
	ii) Explain the application of Overlay(6)		
3	Illustrate with an example the following (i) Distance measurement(7) ii)pattern analysis.(6)	BTL -3	Apply
4	i) Analysis Random and Nonrandom Patterns(7) ii) Analyze about the 3D views of terrain(6)	BTL -4	Analyze
5	Give in detail about an application that uses basic tools of vector data analysis including Buffer, Overlay, and Select.(13)	BTL -2	Understand
6	Describe in detail Moran's I for Measuring Spatial Autocorrelation(13)	BTL -1	Remember
7	i) Discuss the G-Statistic for Measuring the High/Low Clustering.(7)	BTL -2	Understand
	ii) Express the feature manipulation.(6)		
8	State and discover how to inlay the information directly within the page. (13)	BTL -3	Apply
9	Analyze the following (i)shortest path problem(7) (ii)Travelling salesperson problem(6)	BTL -4	Analyze
10	Describe the following i)vehicle Routing Problem(7) ii)Closest Facility(6)	BTL -1	Remember
11	Develop the Allocation and Location–Allocation in network analysis(13)	BTL -6	Create
12	Describe in detail about digital education model(13)	BTL -2	Understand
13	i)Mention and analyze the 3d data collection(7) ii) Explain what is 3D draping,show how DEMS and TINs provide surface for 3D views and 3D draping.(6)	BTL -4	Analyze
14	Describe in detail about 3d utilization.(13)	BTL -1	Remember

Part C

1	Analyze a scenario in which Intersect is preferred over Union for an overlay operation.(15)	BTL -4	Analyze
2	Both Moran's I and the G-statistic have the global (general) and local versions. How do these two versions differ in terms of pattern analysis? Conclude your answer (15)	BTL5	Evaluate
3	The objective is to find the shortest route between two cities in <i>uscities.shp</i> on the interstate network. The shortest route is	BTL6	Create

	defined by the link impedance of travel time. The speed limit for calculating the travel time is 65 miles/hour. Helena, Montana, and Raleigh, North Carol. Design the shortest route (15)		
4	Create a Geodatabase Network Dataset (15)	BTL6	Create

UNIT V -

GIS Applicant - Natural Resource Management - Engineering - Navigation - Vehicle tracking and fleet management - Marketing and Business applications - Case studies

PART A

S. No.	Question	BTL	Competence
1	Tabulate the three categories of GIS applications.	BTL -1	Remember
2	Describe the business application of GIS.	BTL -1	Remember
3	Assess Location-Based Services.	BTL -5	Understand
4	Define GIS applicant.	BTL -1	Remember
5	What are the four trends in marketing?	BTL -1	Remember
6	Analyze how to create route.	BTL -4	Analyze
7	Point out How did we navigate before using GPS.	BTL -4	Understand
8	Give the four types of route.	BTL -1	Remember
9	Express how we navigate using GPS.	BTL -2	Analyze
10	point out few Current problems in natural resource management	BTL -4	Analyze
11	Illustrate the software needed for tracking vehicle.	BTL -3	Apply
12	Develop how the GIS infiltrate the areas of IT.	BTL -6	Create
13	Demonstrate how does GIS fit into natural resource management?	BTL -3	Apply
14	Discover how Tracking system technology was made possible by the integration of three new technologies.	BTL -3	Apply
15	Develop corporate GIS.	BTL -6	Create
16	Express Few application of GIS.	BTL -2	Understand
17	Discuss multi-department GIS.	BTL -2	Evaluate
18	Summarize the market predictions.	BTL -5	Evaluate
19	Give a diagram for the development of GIS application.	BTL -1	Remember
20	Describe NAVSTAR.	BTL -2	Understand

Part B

1	Briefly describe the business application of GIS(13)	BTL -2	Understand
2	Describe the following i) Simple route(7) ii) Combined route(6)	BTL -1	Remember
3	i) Describe about the marketing application(7) ii) Discuss the four trends in marketing(6)	BTL -2	Understand
4	i) Illustrate how gis type functionality is useful in navigation(7) ii) Demonstrate an example of GIS.(6)	BTL -3	Apply
5	Analyze in detail about natural resource management.(13)	BTL -4	Analyze
6	i) Summarize the Current problems in natural resource management(7) ii) Explain why do institutions need an AVL and/or Dispatch system(6)	BTL -5	Evaluate
7	i) Analyze who needs AVL .(7) ii) Explain how dynamic segmentation is used to manage the data in fleet management.(6)	BTL -4	Analyze
8	i) Describe in detail about Dispatching.(7) ii) Describe an example of how market production exist.(6)	BTL -1	Remember
9	i) Generalize Secondary Menu.(7) ii) Develop the components of modern AVL system(6)	BTL -6	Create
10	Describe the following i) Split route(7) ii) Looping route(6)	BTL -1	Remember
11	i) Discuss how gis is useful in tracking the vehicle.(7) ii) Discuss real time example of traffic map(6)	BTL -2	Understand
12	Infer the various market predications.(13)	BTL -4	Analyze
13	Tabulate Navistar in geographic information system.(13)	BTL -1	Remember
14	Explain and illustrate how GPS is useful in navigation and tracking devices. .(13)	BTL -3	Apply

PART-C

1	Develop a case study for the business applications. What was the most important for the success of an application.(15)	BTL6	Create
2	Summarise in detail about the application of GIS in Waste Collection & Municipal Operations.(15)	BTL5	Evaluate
3	Develop AVL for Courier Operations at Aramex .(15)	BTL6	Create

4	Prepare Fuel Distribution Auditing and Vehicle Tracking(15)	BTL6	Create
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