



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad-500043

## CIVIL ENGINEERING TUTORIAL QUESTION BANK

<b>Course Name</b>	: <b>Remote Sensing and GIS.</b>
<b>Course Code</b>	: <b>A70140.</b>
<b>Class</b>	: <b>IV B. Tech I Semester.</b>
<b>Branch</b>	: <b>Civil Engineering.</b>
<b>Year</b>	: <b>2018 – 2019.</b>
<b>Course Coordinator</b>	: <b>Y. Ravi Kumar, Assistant professor, Department of Civil Engineering.</b>
<b>Course Faculty</b>	: <b>Y. Ravi Kumar, Assistant professor, Department of Civil Engineering.</b>

### COURSE OBJECTIVE:

Remote Sensing and GIS is a relatively recent discipline and is an area of emerging technology with a phenomenal growth over last four decades. The Remote Sensing technology is now beyond the art of Map making from satellite or Aerial images. It has interleaved with information technology where raw digital data is converted to information which in turn aid to the knowledge base for quick and correct decision making. The digital data handling led to the development of GIS (Geographical Information System). Remote Sensing coupled with GIS and GPS techniques has dramatically enhanced human capability for natural and manmade resources exploration, mapping and monitoring on local and global scale. The demand for Remote Sensing and GIS is increasing day by day in Government and Private sector. The course is not only going to enhance job opportunity for the civil students but shall also open an avenue of effective and viable interaction with national establishments related to various aspects of remote sensing.

S. No	Question	Blooms Taxonomy level	Course Outcomes
<b>UNIT – I</b>			
<b>INTRODUCTION TO PHOTOGRAMMETRY</b>			
<b>Part - A (Short Answer Questions)</b>			
1	What is meant by photogrammetry?	Remember	1
2	How many minimum number of photographs are required for Stereo Photogrammetry?	Remember	2
3	Define drift in while taking aerial photographs.	Remember	2
4	What is meant by Focal length of lens is aerial photography?	Remember	1
5	What are fiducial marks on an image negative in aerial photogrammetry?	Understand	2
6	Define the Scale of a vertical aerial photograph?	Remember	1
7	What is stereoscope?	Remember	2
8	What is meant by Relief Displacement?	Understand	1
9	Elucidate the basic geometrical elements of a vertical aerial photograph with a neat sketch.	Understand	1
10	Distinguish the difference between a map and an ortho photo and describe the following terms: GCP, mosaic, Stereo pair, Fiducial marks.	Remember	1
11	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Understand	1
12	Elucidate the basic geometrical elements of a vertical aerial photograph with a neat sketch.	Understand	2
13	What is stereoscope?	Understand	2

14	What is low oblique photograph and high oblique photograph?	Understand	1
15	Define tilt displacement?	Remember	2
16	Define fudicial point, scale and relief displacement	Remember	1
17	Define the Scale of a vertical aerial photograph?	Remember	2
18	Explain what is meant by Photogrammetry? What are the uses of Aerial and/or Satellite Photogrammetry?	Understand	1
19	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Understand	2
20	What is counter interval?	Understand	2
<b>Part - B (Long Answer Questions)</b>			
1.	What is photo scale? Discuss with an example.	Understand	1
2.	If the distance of a line on the photographic known as 1 cm, what is it's equivalent distance on the ground if the photographic scale is 1: 10,000	Remember	2
3.	Elucidate the basic geometrical elements of a vertical aerial photograph with a neat sketch.	Understand	2
4.	Distinguish the difference between a map and an ortho photo and describe the following terms: GCP, mosaic, Stereo pair, Fiducial marks.	Remember	1
5	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Remember	2
6	Illustrate how the difference in elevation displaces the position of a photographic image.	Understand	1
7	Discuss about various types of Aerial Photogrammetric techniques.	Remember	1
8	What is Fudicial Centre? How it is determined explain with a neat diagram.	Remember	2
9	Define the following 1) Nadir Point 2) Pass point 3) Tie Point 4) Control Point	Remember	1
10	There are three types of errors in photogrammetry.	Remember	1
11	What are the two methods which can be used to determine the scale of the aerial photograph?	Remember	2
12	What are the basic advantages of vertical air photos?	Understand	2
13	Discuss the parallax measurement of height determination.	Remember	2
14	What is the difference between distortion and displacement?	Understand	2
15	What is the advantage of an oblique aerial photograph?	Understand	1
<b>Part - C (Problem Solving and Critical Thinking Questions)</b>			
1	Explain what is meant by Photogrammetric? What are the uses of Aerial and/or Satellite Photogrammetry?	Understand	1
2	What is difference between an oblique photograph and panoramic photograph?	Understand	1
3	Relief Displacement exists because photos are a perspective projection. Explain how can this be used to determine the height of an object on the terrain?	Remember	2
4	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Understand	1
5	Discus the different types of aerial photograph.	Understand	1
6	Illustrate end lap, side lap, and forward lap.	Understand	1
7	Illustrate the scale of Aerial photograph.	Understand	1

8	Write short notes on: a) Scale b) Photograph c) Contour interval d) Crab e) Drift	Understand	1
9	Distinguish an oblique and highly oblique Aerial photograph?	Remember	2
10	What are factors effecting in aerial photographs?	Remember	2
11	Discuss the role of disaster management authorities in disaster management.	Remember	5
12	Discuss the role and functions of a Disaster Manager.	Remember	5
13	Examine the changing complexion of disaster management in the contemporary context.	Understand	5
14	Highlight the significance of planning for ensuring disaster prevention.	Remember	5
<b>UNIT - II</b>			
<b>REMOTE SENSING</b>			
<b>Part – A (Short Answer Questions)</b>			
1	Define Remote Sensing.	Remember	2
2	Define Scattering.	Remember	2
3	What is active remote sensing and passive remote sensing?	Remember	2
4	Explain about two energy sources available for earth passive remote sensing and elucidate with their spectral characteristic curves.	Remember	2
5	Describe spectral properties of water bodies and how these can be used to differentiate pure and sediment water.	Understand	2
6	What is passive remote sensing?	Understand	2
7	Define Ground control points.	Remember	2
8	Which part of the EMR spectrum is used for radar remote sensing.	Understand	2
9	Which part of the EMR spectrum is used for optical remote sensing.	Remember	2
10	In earth remote sensing, What are the visible wavelength bands used?	Remember	2
11	Which part of the EMR spectrum is used for radar remote sensing.	Remember	2
12	Define Spatial Resolution?	Remember	2
13	What is meant by Spectral Resolution?	Remember	2
14	Define Radiometric Resolution?	Remember	2
15	Atmospheric Windows are useful in Remote Sensing. Why?	Remember	2
16	In which orbits the Earth Remote Sensing Satellite revolve?	Understand	2
<b>Part - B (Long Answer Questions)</b>			
1.	Analyze the elements or processes involved in earth remote sensing with a neat diagram.	Remember	2
2.	Illustrate the Electromagnetic spectrum, with emphasis on optical visible spectral bands.	Understand	2
4.	Discuss the difference between active and passive remote sensing and explain about the energy sources used.	Remember	2
5.	Scrutinize various applications and advantages of aerial and satellite remote sensing.	Understand	2
4	Explain about two energy sources available for earth passive remote sensing and elucidate with their spectral characteristic curves.	Understand	2
5	Describe spectral properties of water bodies and how these can be used to differentiate pure and sediment water.	Understand	2

6	In earth remote sensing, What are the visible wavelength bands used?	Remember	2
7	Discuss the interaction of Electromagnetic Radiation with the Earth's atmosphere using various scattering mechanism.	Remember	2
8	Write a detailed note on NOAA Satellite. And Discuss the particulars of NOAA Satellites.	Remember	2
9	Draw a neat diagram classification of imaging sensor systems.	Remember	2
10	What resolution? Illustrate different types of resolution.	Understand	2
11	Which part of the EMR spectrum is used for radar remote sensing?	Remember	2
12	Which part of the EMR spectrum is used for optical remote sensing?	Remember	2
13	Name some important satellite platforms which are in orbit currently.	Understand	2
14	What is visible wavelength band used in Earth Remote Sensing?	Remember	2

**Part – C (Problem Solving and Critical Thinking)**

1	Discuss the following terms often used in Aerial and satellite Remote Sensing. i. Spatial Resolution. ii. Temporal Resolution.	Remember	2
2	Discuss the following terms often used in Aerial and satellite Remote Sensing. i. Spectral Resolution. ii. Radiometric Resolution.	Understand	2
3	What best way the term Remote Sensing is defined Write about the Types of Platforms used in Remote Sensing?	Remember	2
4	What are atmospheric windows and write about the atmospheric windows in optical Remote Sensing.	Remember	2
5	What are the visual image interpretation elements in Remote Sensing?	Understand	2
6	Describe the interaction process of Electromagnetic radiation with the Earth's surface features.	Understand	2
7	Discuss how the sensors are classified or categorized in Remote Sensing.	Remember	2
8	Explain the terms Spectral Reflectance, Specular reflection, Diffuse reflection.	Understand	2
9	Name at least three platforms used for Earth Remote Sensing.	Remember	2
10	Is RADAR Imaging Satellite (RISAT) of India is a platform for Active Sensor or Passive sensor? Why?	Understand	2
11	Define the basic concepts and foundation of Remote Sensing.	Understand	2
12	Define remote Sensing and components of Remote Sensing.	Understand	2
13	What is Active remote sensing? Explain with an example.	Understand	2
14	What is passive Remote Sensing? Explain with an example.	Understand	2

**UNIT-III  
GEOGRAPHIC INFORMATION SYSTEM**

**Part - A (Short Answer Questions)**

1	Define GIS.	Understand	3
2	What are the 4Ms of GIS?	Remember	3
3	Define Spatial data and Attribute data.	Understand	3
4	Name the three basic types of map projections classified based on developable surfaces.	Understand	3
5	Define map projection. Why is map projection necessary in map making?	Remember	3
6	Define Coordinate system.	Understand	3
7	What are the data used in ArcGIS?	Understand	2
8	What is Map?	Remember	2

9	Define non- spatial data with an example.	Remember	2
10	What are the different components of GIS?	Remember	2
11	Define Raster Data and Vector data.	Understand	2
12	Write the major application areas and uses of Geographic Information System in the management of earth resources.	Remember	2
13	What are data sources in GIS?	Understand	2
14	What is feature in GIS?	Remember	2
15	Write the contribution disciplines of GIS.	Understand	3
16	What is Geospatial data?	Understand	3
17	What are the three different features used in GIS for Representation?	Remember	3
18	Explain point feature with some examples.	Understand	2
19	Explain line feature with some examples.	Understand	2
20	Explain polygon feature with some examples.	Understand	2
21	Explain the difference between data and Information.	Remember	3
22	Give some application areas of GIS.	Understand	3
23	What is base map and primary data.	Understand	3
24	Name the three basic types of map projections classified based on developable surfaces.	Remember	3
25	Explain Joining of spatial and Attribute data.	Remember	2
26	Define Coordinate system.	Understand	2
27	What are the data used in ArcGIS?	Understand	2
28	What is a Map?	Remember	3
29	Define Datum.	Remember	3
30	Discuss the properties of Map Projection.	Remember	3
31	What are commonly used map projection?	Understand	2
32	Define Metadata in GIS	Remember	3
33	What are data sources in GIS?	Understand	2
34	Define vertical Datum's.	Remember	2
35	Define map projection.	Understand	3
36	Draw and explain plane rectangular coordinates?	Remember	3
37	What is plane polar rectangular coordinate system?	Understand	3
38	Define geographic coordinate system of the earth.	Remember	2
39	Write the classification of map projection.	Remember	2
40	What is Cylindrical projection?	Remember	2
41	Define conical projection.	Remember	3
42	What is planner and azimuthal projection?	Understand	3
43	What do you mean by projected coordinate systems?	Understand	3
44.	Define Geodatic Datum.	Understand	2
45.	What is Georeferencing?	Understand	2
46.	Define the term digitizing in GIS.	Understand	3

47.	Write the applications of GIS in Civil Engineering?	Understand	3
48	Define Latitude and Longitude.	Understand	3
<b>Part – B (Long Answer Questions)</b>			
1	List the major application areas of GIS		
2	Discuss GIS as a Tool for decision support system.	Remember	3
3	What are common errors in GIS data bases? Write about the importance of Edge matching and rubber sheeting.	Remember	2
4	Define the following term in the context of geographic coordinate system of Earth : latitude, longitude, parallel, meridian	Understand	2
5	Differentiate between the study of GIS as a special field of academic discipline and the study of GIS as a branch of Information Technology	Understand	2
6	Define the following terms : a) Georeferencing b) mean sea level, geodetic datum, vertical datum	Understand	2
7	Explain the meaning of map scale 1: 10,000. Is this a larger or smaller map scale than a map scale of 1: 1,000?	Remember	2
8	Discuss what is meant by feature based GIS	Understand	3
9	Describe vector data storage and attribute data storage in GIS	Understand	3
10	Geographic Information System (GIS) can be defined in many ways. Write three frequently used definitions of GIS.	Understand	3
11	Describe various data storage methods used in GIS.	Remember	3
12	Describe the characteristics and functions of DBMS.	Remember	3
13	Name the three basic types of map projections classified based on developable surfaces.	Remember	3
14	Define map projection. Why is map projection necessary in map making?	Remember	3
<b>Part – C (Problem Solving and Critical Thinking)</b>			
1	Briefly describe various elements involved in Geographic Information System.	Remember	3
2	Describe the theoretical frame work and operations involved in Geographic Information System.	Understand	2
3	Write the major application areas and uses of Geographic Information System in the management of earth resources.	Understand	2
4	Name some data input devices? And Explain with a neat diagram.	Remember	2
5	What are the technology component of GIS Explain with a neat diagram?	Remember	2
6	List the keywords that you would like to include in typical definition of geographic information systems.	Understand	2
7	Explain the difference between “data” and information related to knowledge and intelligence.	Remember	2
8	Describe the characteristics of an information system.	Remember	3
9	In what ways are GIS different from other classes of information systems?	Remember	3
10	Explain the origin and meaning of “Geomatics” and “Geographic Information science” How do they differ from Geographic Information Systems?	Understand	2
11	What are the major application areas of GIS		
13	Digitizer is a device to convert graphic data into digital data. What is a digitizing operation in GIS?	Understand	3
14	What are the map projection and transformation in GIS?	Understand	2
15	Discuss in detail integration of Remote Sensing and GIS.	Understand	3

<b>UNIT-IV VECTOR DATA MODEL</b>			
<b>Part – A (Short Answer Questions)</b>			
1	Define topographic map	Understand	4
2	What is the feature used for showing the location	Remember	5
3	Define Geographic Information System?	Remember	6
4	What are the major elements of Geographic Information System?	Understand	5
5	Define types of vector data.	Remember	5
6	Write any two uses of Geographic Information System?	Remember	3
7	What is Non- Spatial data?	Understand	5
8	What is spatial data?	Understand	4
9	What is attribute data or non-spatial data?	Understand	6
10	What feature in vector GIS?	Understand	5
11	Define Polyline as feature with an example.	Remember	4
12	Define polygon as feature with an example.	Remember	5
13	Write the sources of vector data.	Understand	3
14	What is base map?	Remember	4
15	List out the secondary data sources.	Understand	5
<b>Part – B (Long Answer Questions)</b>			
1	What is topology and its importance in GIS?	Remember	3
1	Explain the difference between the concepts of data accuracy” and data precision.”	Remember	4
2	What are the components of geospatial data standards	Remember	5
3	What is shape file? What are the different types of features in vector data model	Understand	4
4	Compare and contrast the raster and vector data model.	Understand	4
5	What are the advantages of raster data model	Remember	5
6	Discuss what is the overall goal of data base management system	Understand	5
7	Describe layers in GIS. Draw with a neat diagram	Understand	4
8	Name three basic file structures used in GIS?	Understand	5
9	What is the Difference between choropleth and Isopleth thematic maps?	Remember	5
10	What purpose does the Grid or Cell serve in data representation?	Understand	5
11	How a minimum mapping unit is different from the size of a raster cell?	Remember	4
12	What are the input data sources for GIS that serve as primary data? List out the secondary data sources.	Understand	3
<b>Part – C (Problem Solving and Critical Thinking)</b>			
1	Explain Vector data storage and attribute data storage in GIS.	Remember	5
2	Write about the method of obtaining vector data using scanners.	Understand	5
3	Explain digitization process and write its advantages.	Understand	3
4	What are common errors in GIS data bases? Write about the importance of Edge matching and rubber sheeting.	Understand	3
5	Discuss what is mean by feature based GIS.	Remember	5
6	Explain GIS data file management by referring to the three basic computer file structures.	Understand	5

7	Describe various data storage methods used in GIS.	Understand	5
8	Write an overview of the data manipulation using Hierarchical Raster Structures containing Quad tree data Structure and Pyramid data structures in GIS.	Remember	5
9	Describe the Computational Analysis Methods(CAM) and Visual Analysis Methods (VAM) used in GIS.	Remember	3
10	Explain Integrated analysis of the spatial and attribute data in GIS.	Understand	4
<b>UNIT-V</b>			
<b>RASTER DATA MODEL</b>			
<b>Part - A (Short Answer Questions)</b>			
1	What is a Digital remote sensing image?	Remember	7
2	What is DN number?	Remember	6
3	What is data conversion?	Remember	6
4	Define Adhoc data?	Remember	6
5	Digital aerial photographs are represented in in raster data form or vector data form? Why?	Remember	7
6	Give some examples of data that is stored in Vector form?	Understand	6
7	Name the methods used for conversion of data between raster and vector data forms.	Remember	7
8	Name three basic file structures used in GIS?	Remember	7
9	What is meant by Cleaning in data editing?	Understand	6
10	Define classes?	Understand	7
11	Name a few vector models and answer what they are?	Remember	6
12	List out at least three popular GIS Raster data file formats.	Understand	7
13	What is an Overlay operation in GIS?	Remember	7
14	Explain Computational Analysis method.	Understand	7
15	What is Visual Analysis Method?	Understand	6
16	Name a few data forms for visual analysis.	Remember	7
17	Give some examples and write about graphical output for data visualization.	Understand	6
18	Define Hierarchical data structures.	Understand	7
19	List out a few data storage media.	Remember	6
20	What is a Hybrid system in integrated data analysis?	Understand	7
<b>Part - B (Long Answer Questions)</b>			
1	Describe the data stream flow in GIS system with a block diagram.	Remember	7
2	Critically examine what is meant by Layer based GIS with examples.	Understand	6
3	What are Raster and Vector data forms. Compare Raster data and Vector data representations.	Understand	7
4	Explain about data capture, data input, and data output in Geographic Information System.	Remember	7
5	What are the advantages of vector model data model?	Understand	7
6	Explain with a neat diagram how real world data is converted into Raster format.	Understand	7
7	Define data. What are the input data sources for GIS that serve as primary data? List out the secondary data sources.	Understand	7
8	What is overlay operation in GIS?	Understand	7



9	What is meant by cleaning in data editing?	Understand	6
10	Explain integrated analysis of spatial and attribute data.	Understand	6
11	Explain GIS data file management by referring three basic computer file structures.	Understand	6
<b>Part – C (Problem Solving and Critical Thinking)</b>			
1	Explain how buffering is carried out in raster data.	Remember	6
2	Explain Data capture, data input and data output in GIS	Remember	7
3	Describe data stream flow in GIS system with a block diagram.	Remember	7
4	Critically examine what is meant by layer absed GIS with examples.	Understand	7
5	Explain about data capture, data input, and data output in Geographic Information System.	Understand	7
6	Explain digitization process and write its advantages.	Understand	6
7	Digitizer is a device to convert graphic data into digital data. What is digitizing operation in GIS?	Understand	7
8	Write about the method of obtaining vector data using scanners.	Remember	6
9	Write the major applications areas and uses of Geographic Information System in the management of earth resources.	Remember	7
10	What purpose does the Grid or cell serve in data representation?	Remember	7
11	How a minimum mapping unit is different from the size of a raster cell?	Remember	7

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