SRM VALLIAMMAI ENGINEERING COLLEGE
(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

V SEMESTER

CE3564 - REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM FOR CIVILENGINEERING

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Odd Semester

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DEPARTMENT OF CIVIL ENGINEERING
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SUBJECT NAME: REMOTE SENSING AND GIS FORCIVIL ENGINEERING

SUBJECT CODE: CE3564

SEM / YEAR: V/ III

UNIT-I: REMOTE SENSING AND ELECTRO MAGNETIC RADIATION

Definition – Components of Remote Sensing – History of Remote Sensing – Merits and demerits of data collation between conventional and remote sensing methods -Active and Passive Remote Sensing – Electro Magnetic Radiation (EMR) – EMR spectrum – Visible, Infra-Red (IR), Near IR, Middle IR , Thermal IR and Microwave – Black Body Radiation. Wave theory - Planck's law, Wien''s Displacement Law, Stefan''s Boltzmann law, and Kirchhoff''s law.

PART - A

1.	What is remote sensing?	BT-2	Understanding
2.	List out the application of remote sensing.	BT-1	Remembering
3.	What are the components of remote sensing?	BT-2	Understanding
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.	List out the advantages of active sensor.	BT-1	Remembering
8.	What are the types of platforms?	BT-4	Analysing
9.	Find out where the low resolution and high resolution cameras are used in remote sensing.	BT-1	Remembering
10.	List out what determines the range resolution in radar.	BT-3	Applying
11.	Name the different type of electromagnetic radiation.	BT-1	Remembering
12.	List out the primary absorbents of electromagnetic energy in the atmosphere	BT-2	Understanding
13.	Differentiate geostationary orbit and polar sun synchronous orbit	BT-1	Remembering
14.	Write short note on temporal resolution.	BT-2	Understanding
15.	Write types of micro wave sensor.	BT-1	Remembering
16.	Define Stefen-Boltzman law.	BT-2	Understanding
17.	Differentiate the specular reflectors and diffuse reflectors.	BT-1	Remembering
18.	Define Spectral reflectance.	BT-1	Remembering
19.	Write short notes on spatial resolution.	BT-2	Understanding
20.	Define Wien's displacement law.	BT-1	Remembering
21.	Define Atmospheric window?	BT-4	Analysing
22.	Write the difference between spectral and spatial resolution.	BT-1	Remembering
23.	Write types of resolution.	BT-3	Applying
24.	What is active sensor?	BT-1	Remembering
25.	Write about on Energy Sources and Radiation Principles.	BT-2	Understanding

1.	Discuss 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.	Describe about active sensors with example.	BT-1	Remembering
6.	Explain the significance of EMR in remote sensing?	BT-1	Remembering
7.	Detail about sensor based methods of scanning	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.	On the basis of function of sensors in remote sensing, classify its types and explain.	BT-2	Understanding
10.	Explain briefly about the concept of resolution and its types.	BT-2	Understanding
11.	Detail about on recent satellites with its applications.	BT-2	Understanding
12.	Brief about the advantages and limitation of remote sensing.	BT-2	Understanding
13.	Describe the History of Remote Sensing.	BT-5	Evaluating
14.	Briefly explain about on elements of the data acquisition process.	BT-2	Understanding
15.	Discuss the contributions of IRS & LANDSAT.	BT-4	Analysis
16.	Explain the difference between sensor and platforms in remote sensing?	BT-2	Understanding
17.	Describe about passive sensors with examples.	BT-2	Understanding
18	Explain in detail about the Supervised Classification of satellite images.		

UNIT-II: EMR INTERACTION WITH ATMOSPHERE AND EARTH MATERIAL

Standard atmospheric profile – main atmospheric regions and its characteristics – interaction of radiation with atmosphere – Scattering, absorption and refraction – Atmospheric windows - Energy balance equation – Specular and diffuse reflectors – Spectral reflectance & emittance – Spectroradiometer – Spectral Signature concepts – Typical spectral reflectance curves for vegetation, soil and water – solid surface scattering in microwave region..

1.	Define remote sensing.	BT-2	Understanding
2.	What are the components of remote sensing	BT-1	Remembering
3.	Define spectral signature curve	BT-2	Understanding
4.	What are the types of resolution	BT-1	Remembering
5.	Write the applications of remote sensing	BT-2	Understanding
6.	Define Stefan-Boltzmann law	BT-1	Remembering
7.	Define wein's displacement law	BT-1	Remembering
8.	Explain wave theory.	BT-2	Understanding
9.	Define Particle theory.	BT-1	Remembering
10.	How can you relate the electromagnetic energy radiation with the absorption of ozone?	BT-4	Analysing
11.	What is electromagnetic spectrum?	BT-1	Remembering
12.	What are the types of scattering?	BT-3	Applying
13.	Write the energy balance equation?	BT-1	Remembering
14.	When is Rayleigh scatter occur?	BT-2	Understanding
15.	Draw a spectral signature curve for soil, water and vegetation.	BT-2	Understanding
16.	What are the primary colours?	BT-2	Understanding
17.	What is the wavelength of Near IR?	BT-1	Remembering
18.	Define Atmospheric window.	BT-2	Understanding
19.	What is non-selective scattering?	BT-1	Remembering
20.	What is black body radiation	BT-2	Understanding

21.	Define Track number.	BT-1	Remembering
22.	What do you understand about Spatial filtering	BT-1	Remembering
23.	Define scanning.	BT-2	Understanding
24.	What are the different types of data products in remote sensing?	BT-1	Remembering
25.	Define CAN Data.	BT-4	Analysing

PART – B

1.	Briefly explain about the three forms of interaction that can take place when energy strikes upon the surface.	BT-1	Remembering
2.	What are waves? Explain about longitudinal and transverse waves. Also write the notes on frequency of and write the wave equation.	BT-5	Creating
3.	Describe the electromagnetic spectrum with neat sketch for remote sensing data.	BT-1	Remembering
4.	Explain the atmospheric interaction with electromagnetic radiation.	BT-1	Remembering
5.	Explain the spectral reflectance characteristics for soils, water & vegetation.	BT-5	Creating
6.	What are types of scattering signature? Explain.	BT-1	Remembering
7.	Write short note on spectral signature concepts	BT-1	Remembering
8.	Explain the effects of surface roughness on scattering of EM energy.	BT-2	Understanding
9.	Explain energy interaction with earth surface materials.	BT-4	Analyzing
10.	Explain the components of real Remote sensing System.	BT-1	Remembering
11.	Detail Sources and characteristics remote sensing data products.	BT-5	Creating
12.	Explain the role of Satellite Imagery and other Data Sets.	BT-1	Remembering
13.	Describe about on types of remote sensing data products based on area of coverage.	BT-2	Understanding
14.	Detail advantages and disadvantages of Digital image processing.	BT-1	Remembering
15.	Detail about types of data products application in agriculture.	BT-2	Understanding
16.	(i) Detail the procedure to ordering the remote sensing data. (ii) Write short note on Interpretation keys.	BT-4	Analyzing
17.	List the types of remote sensing products & satellites.	BT-1	Remembering
18	Discuss in detail about the basic components of Remote sensing system.	BT-1	Remembering

UNIT-III: ORBITS AND PLATFORMS

Motions of planets and satellites – Newton‚s law of gravitation – Gravitational field and potential - Escape velocity - Kepler‚s law of planetary motion – Orbit elements and types – Orbital perturbations and maneuvers – Types of remote sensing platforms - Ground based, Airborne platforms and Space borne platforms – Classification of satellites – Sun synchronous and Geosynchronous satellites – Legrange Orbit.

PART - A

1.	Differentiate active sensor and passive sensor?	BT-2	Understanding
2.	What is called remote sensing platform? Mention the types.	BT-1	Remembering
3.	Define (i) Swath (ii) Nadir	BT-2	Understanding
4.	Write the radar equation.	BT-1	Remembering
5.	Differentiate between radiometric resolution & spectral resolution of satellite Image data.	BT-2	Understanding
6.	What is meant by across track scanning?	BT-1	Remembering
7.	Define radar sat.	BT-1	Remembering
8.	List out any high resolution data of Indian satellite with their spectral resolution.	BT-2	Understanding
9.	Explain SLAR system.	BT-1	Remembering
10.	What are the characteristics of land satellites?	BT-4	Analysing
11.	What are the uses of weather satellite?	BT-1	Remembering
12.	Define SAR.	BT-3	Applying

13.	Define aerial and space platforms?	BT-1	Remembering
14.	List out the application of geostationary satiates?	BT-2	Understanding
15.	Distinguish between satellite remote sensing & microwave remote sensing.	BT-2	Understanding
16.	What are polar orbiting satellites?	BT-2	Understanding
17.	Mention any two satellite data products.	BT-1	Remembering
18.	What are types of orbit?	BT-2	Understanding
19.	Differentiate between BIL and BSQ format of satellite image data.	BT-1	Remembering
20.	What are sun-synchronous satellites?		Understanding
21.	What are the disadvantages of GIS?	BT-1	Remembering
22.	Define spatial data.	BT-1	Remembering
23.	Define software.	BT-2	Understanding
24.	Define hardware.	BT-1	Remembering
25.	What do you mean by general purpose of maps?	BT-4	Analysing

PART – B

1.	Write brief note on Geo-Stationary orbit, Sun-Synchronous and polar orbit.	BT-2	Understanding
2.	Discuss in details on air borne and space borne TIR.	BT-1	Remembering
3.	Explain the platform and sensors available at present for acquisition of satellite imageries.	BT-5	Evaluating
4.	Explain the characteristics of Landsat satellite and their sensors.	BT-3	Applying
5.	Explain in details about SLAR and their advantages. And also write the importance of radar principle in microwave remote sensing.	BT-5	Evaluating
6.	Give a detail specification and characteristics on meteorological satellites.	BT-4	Analysing
7.	Describe the various types of resolutions and scale of satellite imageries.	BT-1	Remembering
8.	Explain the characteristics of various sensing systems.	BT-5	Evaluating
9.	Discuss the principle of radar.	BT-4	Analysing
10.	Discuss the factors affecting microwave measurement.	BT-4	Analysing
11.	Define radiometer and enumerate the working principle of a long track and across multiple spectral scanners with neat sketch.	BT-2	Understanding
12.	Explain sun synchronous and geo synchronous. Discuss in detail about the geometric characteristics of imagery.	BT-3	Applying
13.	.Explain the orbital and sensor characteristics of Indian remote sensing Satellites.	BT-2	Understanding
14.	What are the data output devises with given any one example with sketch?	BT-1	Remembering
15.	Write short notes on: (i) Spatial & attribute data (ii) Geographic scales	BT-2	Understanding
16.	Write short notes on: (i)Requirements of GIS (ii)GIS vs GBMS	BT-1	Remembering
17.	Detail about History of GIS.	BT-5	Evaluating
18.	Explain in detail about the utilization of Remote sensing and GIS techniques for Least cost highway alignment modeling.	BT-3	Applying

UNIT-IV: GEOGRAPHIC INFORMATION SYSTEM

GIS – Components of GIS – Hardware, Software and Organizational Context – Data – Spatial and Non-Spatial – Maps – Types of Maps – Projection – Types of Projection - Data Input – Digitizer, Scanner – Editing – Raster and Vector data structures – Comparison of Raster and Vector data structure – Analysis using Raster and Vector data – Retrieval, Reclassification, Overlaying, Buffering – Data Output – Printers and Plotters..

PART - A

1.	What are the major component of GIS system?	BT-2	Understanding
2.	Define map overlay.	BT-1	Remembering
3.	What is the function of DBMS?	BT-2	Understanding
4.	What are the advantages of GPS?	BT-1	Remembering

5.	Write down the different types of projections?	BT-2	Understanding
6.	Define cylindrical projection.	BT-1	Remembering
7.	What is data abstraction in a data base management system?	BT-1	Remembering
8.	What is meant by undershoot and overshoot?	BT-2	Understanding
9.	What is the role of digitization in GIS?	BT-1	Remembering
10.	.What is meant by forest five growth modelling?	BT-4	Analysing
11.	.What is meant by vehicle navigation?	BT-1	Remembering
12.	.List out the basic modules of the GIS software.	BT-3	Applying
13.	What is Geo-Referencing?	BT-1	Remembering
14.	.Define integrates GIS. List out the applications of GIS.	BT-2	Understanding
15.	.What do you mean by general purpose of maps?	BT-2	Understanding
16.	.What is UTM in GIS?	BT-1	Remembering
17.	Define spatial & Non-spatial data.	BT-2	Understanding
18.	What are Thematic Maps?	BT-1	Remembering
19.	What do you meant by Rectification?	BT-2	Understanding
20.	What are the major component of GIS system?	BT-1	Remembering
21.	List at least two attribute analysis techniques.	BT-2	Understanding
22.	What is network analysis?	BT-1	Remembering
23.	Explain hierarchical network.	BT-2	Understanding
24.	Define spatial data in vector format.	BT-1	Remembering
25.	Expand and explain about purpose of DEM.	BT-1	Remembering

PART – B

1.	Describe the fundamental projection classification of maps.	BT-2	Understanding
2.	What are the available software packages for creating GIS projects? Explain.	BT-3	Applying
3.	What are the components of GIS? Explain.	BT-2	Understanding
4.	Write short notes on: (i) Spatial & attribute data (ii) Geographic scales (iii) Requirements of GIS (iv) GIS vs GBMS	BT-1	Remembering
5.	Compare the characteristics of spatial & non-spatial data.	BT-2	Understanding
6.	Write a note on the use of DBNS in GIS.	BT-1	Remembering
7.	Describe the various features of vector overlay processing? What are the data output devises with given any one example with sketch.	BT-5	Evaluating
8.	Discuss about GIS data file management.	BT-2	Understanding
9.	Describe the overlay analysis in GIS.	BT-3	Applying
10.	.Briefly explain the cylindrical projection system.	BT-2	Understanding
11.	Compare the contrast raster and vector data representation with suitable examples.	BT-1	Remembering
12.	Discuss in detail about spatial and non-spatial data.	BT-2	Understanding
13.	Discuss the various types of raster data structures.	BT-1	Remembering
14.	.Explain in detail about UTM projection System.	BT-5	Evaluating
15.	Discuss in detail about modelling process in GIS.	BT-2	Understanding
16.	Detail about land information system.	BT-3	Applying
17.	Elaborate about TIN.	BT-2	Understanding
18.	Discuss in detail about the basic components of Geographical Information System.		

UNIT-V: DATA INTERPRETATION AND CIVIL ENGINEERING APPLICATIONS
Visual Interpretation of Satellite Images – Elements of Interpretation – Interpretation Keys Characteristics of

Digital Satellite Image – Image enhancement – Filtering– Classification - Integration of GIS and Remote Sensing – Application of Remote Sensing and GIS – Urban Applications - Integration of GIS and Remote Sensing – Application of Remote Sensing and GIS – Water resources –
Urban Analysis – Watershed Management – Resources Information Systems.

PART - A

1.	What is conflation?	BT-2	Understanding
2.	Write short note on land information system (LIS).	BT-1	Remembering
3.	Mention the various fields of GIS application in resource management?	BT-2	Understanding
4.	List out the various output devices for raster and vector format.	BT-1	Remembering
5.	Define integrated GIS.	BT-2	Understanding
6.	What is meant by highway alignment?	BT-1	Remembering
7.	State disaster management.	BT-1	Remembering
8.	State different type of scanners user in GIS.	BT-2	Understanding
9.	Differentiate between raster and vector data models.	BT-1	Remembering
10.	What is attribute analysis? List at least two attribute analysis techniques.	BT-4	Analysing
11.	What is attribute data?	BT-1	Remembering
12.	What is dynamic segmentation?	BT-3	Applying
13.	Why is compression needed for remote sensing data?	BT-1	Remembering
14.	Mention any two important methods of data input in GIS.	BT-2	Understanding
15.	What are the advantages of web GIS?	BT-1	Remembering
16.	Define the term digitization?	BT-1	Remembering
17.	What do you understand about raster data model?	BT-2	Understanding
18.	What is mean by query analysis?	BT-1	Remembering
19.	What is line Buffer in GIS? Give one Example.	BT-4	Analysing
20.	Give any two examples of raster data.	BT-1	Remembering
21.	What do you mean by Burn mapping?	BT-3	Applying
22.	List the applications of remote sensing and GIS in hydrological applications.	BT-1	Remembering
23.	Write a short note on applications of GIS in land use changes.	BT-2	Understanding
24.	What do you mean by planimetry?	BT-1	Remembering
25.	Write short notes on applications of RS & GIS in flood inundation.	BT-1	Remembering

PART – B

1.	1. Write detailed note on data models and data compression.	BT-2	Understanding
2.	Discuss in detail about the following (i) Modelling in GIS (ii) Land information system	BT-1	Remembering
3.	Explain in detail about: (i) DEM (ii) TIN	BT-5	Evaluating
4.	Give a detailed account an overlay analysis in GIS.	BT-2	Understanding
5.	Briefly explain the application of GIS in highway alignment project.	BT-3	Applying
6.	Explain how GIs can be utilized as a land information system?	BT-2	Understanding
7.	Explain the characteristics of raster and vector data. How they are represented in GIS database?	BT-1	Remembering
8.	Describe the techniques utilized for raster and vector data compression.	BT-2	Understanding
9.	Describe how raster and vector data models are handled in GIS. State their pros and cons.	BT-1	Remembering

10.	Explain the applications of remote sensing and GIS in health hazards.	BT-5	Evaluating
11.	Discuss the role of GIS in land use and urban planning.	BT-2	Understanding
12.	What are the four basic procedures for inputting spatial data into a GIS?	BT-3	Applying
13.	How will you improve highway planning with the help of GIS? Explain.	BT-2	Understanding
14.	Explain in detail the Digitization and Scanning Processes in GIS.	BT-1	Remembering
15.	Explain the role of GIS in Highway alignment studies	BT-5	Evaluating
16.	Discuss the role of Remote Sensing and GIS in continuous monitoring of Floods with a case study.	BT-2	Understanding
17.	Explain the role of Remote Sensing and GIS in water resources applications in today's scenario.	BT-3	Applying
18.	Explain the features and limitations of any two types of map projections.	BT-1	Remembering