

Program: T.Y.B.Sc IT Semester: VI Program Code: IS00256

Course: Fundamentals of GIS Course Code: USIT604

Duration: 2 ½ Hours Examination Pattern: REV23 – Autonomous-External Max. Marks: 75

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever necessary.

**Examination:**  
**REGULAR**

**Q. 1 Attempt any THREE from the following. [15]**

- (a) Define GIS System, GIS Science, and GIS Applications. Explain each term with suitable example.
- (b) Explain the temporal dimension with suitable example.
- (c) Construct a quad tree for the following three valued raster.

F-Forest Land

I-Industrial Area

R-Residential Area

I	I	I	I	R	R	I	F
I	I	I	I	R	R	F	I
F	F	I	I	R	R	R	R
F	F	F	F	R	R	R	R
F	F	F	F	F	F	I	I
F	F	F	F	F	F	F	F
F	F	F	F	R	R	R	R
F	F	F	F	R	R	R	R

- (d) Write a note on Topology and spatial relationships.
- (e) How modeling helps in representing real world? Explain.
- (f) Define Geographic field. Explain its different data types and values.

**Q. 2 Attempt any THREE from the following. [15]**

- (a) Write a note on Spatial Data Infrastructure.
- (b) Explain the different methods of spatial data capture and preparation in GIS.
- (c) Discuss the major functional components of a Geographic Information System.
- (d) Describe the process of linking GIS with DBMS.
- (e) Write a short note on relational data model.
- (f) What is the reason of using DBMS in GIS?

**Q. 3 Attempt any THREE from the following. [15]**

- (a) What are the different classifications of map projections? Explain any two of them in detail.
- (b) What is interpolation? Explain the process of interpolation for continuous data.
- (c) Write a note on vectorization.
- (d) Write a note on GLONASS.

- (e) What is trend surface fitting? Explain.
- (f) Write a note on Geoid and vertical Datum.

**Q. 4 Attempt any THREE from the following.**

[15]

- (a) Write a detailed note on neighborhood functions in GIS.
- (b) Write a detailed note on GIS and its application models.
- (c) Write a short note on Network Analysis.
- (d) How Error Propagates in GIS? Explain using suitable diagram.
- (e) Perform the raster overlay operation to project Ground Water Level Raster in 2025:

$$R2 = \text{con}(R1 > 5, R1 - 5, 0)$$

R1 – Ground Water Level Raster in 2023

7	8	5	4	3	3
6	4	12	5	4	4
7	10	12	8	7	4
4	8	9	8	7	4
1	1	0	3	0	0
1	0	0	7	0	0

- (f) What are the two main techniques of determining Automatic classification?

**Q. 5 Attempt any THREE from the following.**

[15]

- (a) How can you distinguish between the three temporal cartographic techniques? Explain.
- (b) How do you map quantitative data? Explain.
- (c) Define map dissemination in GIS.
- (d) Explain the meaning of visualization strategies in GIS.
- (e) Name any six visual variables proposed by Bertin.
- (f) How to map terrain elevation? Explain.

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