

(Time: $2\frac{1}{2}$ hours)

[Marks: 75]

Please check whether you have got the right question paper.

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculator is **allowed**.

1. **Attempt any two of the following:** 10
 - a. List and explain GIS operations related to data analysis.
 - b. Write a short note on rasterization.
 - c. Explain the universe transverse Mercator (UTM) grid system. Give suitable example.
 - d. Explain the following terms of object based data model and give suitable example.
 - i. Aggregation
 - ii. Association
2. **Attempt any two of the following:** 10
 - a. What is Root Mean Square error in geometric transformation. Explain the role of RMS error in Affine transformation.
 - b. Explain the map-to-map and image-to-map transformation.
 - c. List the common resampling methods and explain them.
 - d. Explain the bilinear interpolation resampling method with suitable example.
3. **Attempt any two of the following:** 10
 - a. Explain different types of attribute table.
 - b. Explain file and hierarchical database with suitable example.
 - c. Explain
 - i. Dot map
 - ii. Choropleth map
 - d. Explain relational database with suitable example.
4. **Attempt any two of the following:** 10
 - a. Explain data exploration.
 - b. Explain spatial data query with suitable example.
 - c. Explain with suitable example the query by cell value type of raster data query.

[TURN OVER]

- d. What is the output of the following for a statement (slope = 2) AND (Aspect =1)

Aspect

Slope

3	2	1	1	1	2	2	2
2	3	3	3	3	3	1	1
1	2	3	3	2	1	1	3
2	2	3	1	1	1	2	2
2	2	2	1	1	1	1	1
3	2	2	1	2	1	2	3
3	2	3	3	3	2	2	3
2	2	2	1	3	1	3	3

1	2	2	2	1	1	1	2
2	3	1	1	2	2	1	1
1	2	3	3	2	1	1	3
2	2	3	1	1	1	2	2
2	2	2	1	1	3	3	1
3	1	2	1	1	1	2	3
3	1	3	3	1	2	2	3
1	1	1	2	3	2	3	3

5. Attempt **any two** of the following:

10

- Explain Buffering.
- List and explain various overlay operations based on feature type.
- Explain the following map manipulation operations with example.
 - Dissolve
 - Append
- Explain the reclassification local operation of raster.

6. Attempt **any two** of the following:

10

- List and explain the types of spatial interpolation.
- Explain the Density Estimation local method.
- What is Kriging? Explain.
- Define following
 - Anisotropy
 - Range
 - Nugget
 - Partial Sill
 - Sill

7. Attempt **any three** of the following:

15

- Explain the different components of GIS.
- Write a short note on metadata.
- Explain normalization with suitable example.
- Write a short note on feature selection by graphic data query.
- Find the zonal mean for the input raster(a) using a zonal raster(b)

2	7	1	1
9	8	5	3
2	8	4	6
1	4	5	3

(a)

1	1	1	2
1	1	1	2
3	3	2	2
3	3	3	3

(b)

- Describe how semivariance can be used to qualify the spatial dependence in a data asset.