(2½ Hours)

[Total Marks: 75

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** calculators is **allowed**.

1. Attempt *any three* of the following: **15**
a. Define GIS. Briefly explain any two capabilities of GIS.
b. What is GI System, GI Science and GIS Application? Explain.
c. How modeling helps in representing real world? Explain.
d. Define Geographic field. Explain its different data type and values.
e. Write a note on Topology and spatial relationships.
f. Explain the temporal dimension using suitable example.

2. Attempt *any three* of the following: **15**
a. List the functional components of GIS. Explain any two of them in details.
b. Explain the various reasons for using DBMS in GIS.
c. Write a note on Spatial Data functionality.
d. Explain the relational data model using suitable example.
e. Differentiate between Vector data and Raster Data.
f. Write a note on Spatial Data Infrastructure.

3. Attempt *any three* of the following: **15**
a. What are the different classifications of Map Projections? Explain any two.
b. Write a note on GPS.
c. Explain 2D geographic coordinate system using suitable example.
d. What is trend surface fitting? Explain.
e. How Root Mean Square is used to mean location accuracy? Explain.
f. Write a note on Krigging.

4. Attempt *any three* of the following: **15**
a List the four classifications of analytical functions of GIS. Explain any one in details.
b Write a note on automatic classification.
c Explain vector overlay operations using suitable diagram.
d Explain using example how Raster overlay operation can be performed using decision table?
e List any five examples where advanced computations on continuous fields are required.

[TURN OVER]

f Perform the raster overlay operation to find R3

R3 = CON(R1=3 AND (R2 >= 45 and R2 <= 60) , 1 , 0)

R1 - Soil Type Raster

1	1	1	3	3	4	4	7	7
1	1	3	3	4	4	4	7	7
1	3	3	3	4	4	4	7	7
3	3	3	3	4	4	4	5	5
5	5	3	3	3	3	3	5	5
2	2	3	1	1	1	3	4	4
2	2	3	1	1	1	3	4	4
7	2	3	1	1	1	3	4	4
7	7	3	3	3	3	3	4	4

R2 - Rainfall Raster (mm)

70	70	70	70	60	60	60	60	50
70	70	70	70	80	80	80	50	50
50	50	50	80	80	80	50	50	50
50	50	90	90	90	60	60	50	50
50	35	35	35	50	45	60	60	70
35	35	35	50	50	45	60	60	70
45	35	35	50	45	45	60	60	60
45	35	45	45	45	60	60	70	70
45	45	45	45	60	60	70	70	70

5. Attempt *any three* of the following: **15**

a. What is the relationship between Map and GIS?
b. Explain the visualization process in GIS.
c. How to map terrain elevation? Explain.
d. What are Bertin's six categories of visual variables?
e. How to distinguish between three temporal cartographic techniques? Explain.
f. Write a note on Map Cosmetics.
