

2007

**REMOTE SENSING AND
GEOGRAPHIC INFORMATION SYSTEM**

PAPER—I (MOD-1 & 2)

Full Marks : 100

Time : 4 hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Write the answers of questions for each modules in separate books.

MODULE – 1 (Full Marks : 60)

**(Basic Surveying and Mapping Concepts and
Map Projections)**

Group -A

Answer any two questions.

1. What is map? What are the main characteristics of a map ? Classify the maps according to different aspects. 2+4+9
2. Distinguish between traversing and surveying.. From the following bearing and distance, find out the length of DE, while AE and F lie on the same straight line.

LINE	Mg. Bg.	Distance in metre	
AB	92°30'	989	
BC	78° 15'	498	— — .. ^
CD	22°30'	378	
DE	329°15'	?	
EF	62°45'	772	15

Turn Over)

3. 'Any straight line joining two points on Mercator projection is called Rhumb line' - Explain it.

Three points A, B and C are lying on the same straight line with B between A and C. The distance between B and C is 211 metre. The coordinate of A and B are as follows :

$$A = 171^{\circ}E, 512^{\circ}N$$

$$B = 313^{\circ}E, 372^{\circ}N$$

What is the coordinate of C ?

3+12

4. What do you mean by principle scale factor of map projection? Mention the property and uses of UTM projection.

A map of Latin America is drawn on cylindrical equal area projection on a scale 1 : 45,000,000. The rectangular coordinate of a point with respect to the centre ($20^{\circ}E, 0^{\circ}N$) on this projection is found to be 12 gcm East and 8.5 gcm North. Calculate the longitude and latitude of the plane.

3+6+6

Group-B

Answer any *three* questions.

5. **How-does Transverse Mercator Projection differ from UTM grid system?.** 10
6. Explain with suitable diagram the measurement of Geographical variable. 10
7. "Plane Table Survey is a graphical method of survey"- Explain. How does a plane Table Traverse survey differ from a Theodolite Traverse Survey ? 5+5

8. **Define** Geodetic Survey. Differentiate between analog and Digital Cartography. 5+5
9. Write short notes on any *two* of the following : 5+5
- Developed surface.
 - Standard parallel.
 - Bearing.
 - Closing error.

MODULE -. 2 (*Full Marks : 40*)

(Basic Geodesy, Principles of GPS Surveying)

Group-A

Answer any two questions.

1. Define Geodesy. List out the aims of geodesy.	4+6
2. Explain the concept of geoid.	10

3. **Explain ellipsoid**. Give the formula of flattening at the **poles**. What is anthalic sphere,? 6+2+2
4. What is a Geodetic datum ? What datum is accepted for GPS technology ? 7+3

Group--B

Answer any *two* questions.

5. What are the basic components of GPS ? Discuss about control and space segments of NAVSTAR GPS. Illustrate your answer with suitable diagram. 4+6

6. - **What is the basic concept of ranging a satellite ? Why it is necessary to calculate the range between a GPS satellite and a GPS receiver?** 5+5
7. **What are carrier waves ? What is its basic function in GPS technology ?** 3+7
8. **Write short notes on *any two* :** 5+5
- (a) **Ionospheric delay.**
 - (b) **Selective availability.**
 - (c) **Ephemeris data.**
 - (d) **Ranging a satellite.**
 - (e) **Anti-spoofing.**
 - (f) **Tropospheric delay.**