

B.E. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL /MAY 2014

## GEOINFORMATICS ENGINEERING

Fourth Semester

**GI 8402 GEODESY**

(Regulations 2012)

Time: 3 Hours

Maximum Marks: 100

**INSTRUCTIONS:**

1. Answer ALL questions under Part-A and B respectively
2. Assume suitable data wherever necessary
3. Draw neat sketches wherever desirable

**PART - A (10 x 2 = 20 Marks)**

1. Define Geodesy and also mention the purpose of the same.
2. Give the salient details about the Spheroid used for mapping of our country.
3. On Everest spheroid, compute the mean radius of curvature for Guindy area if the mean geodetic latitude is  $13^{\circ}00'30''N$ .
4. How is the area of the trapezium computed on the spheroid?
5. Draw a neat sketch to show the relationship between the geodetic and cartesian co-ordinate system.
6. Compute the spherical excess of an equilateral triangle of side 100Km if the mean geodetic latitude is  $13^{\circ}00'30''N$ .
7. Compute the normal gravity of a point whose geodetic latitude is  $13^{\circ}00'30''N$ .
8. Deduce an expression of Physical Geodesy.
9. Draw a neat sketch to show the availability of stars for an observation program if the observer is at equator.
10. What is an atomic time? Where is it used?

**PART- B (5 x 16 = 80 Marks)**

11. Discuss in details, about the curvilinear co-ordinates. (16)
12. a. Write a detailed note on historical development of Geodesy. (16)

(OR)

- b. Write a brief on the following:
  - i. Engineering Geodesy (4)
  - ii. Lunar Geodesy (4)
  - iii. Planetary Geodesy (4)
  - iv. Interferometric Synthetic Aperture Radar Geodesy (4)

Continued in Page 2

13. a. On Everest spheroid, compute the following with the given Geodetic latitude of  $13^{\circ}00'30''N$
- the difference between semi major and semi minor axis. (2)
  - the difference between Geodetic and Geocentric latitude. (2)
  - the difference between Geodetic and Reduced latitude. (2)
  - the difference between Geocentric and Reduced latitude. (2)
  - the rectangular co-ordinates in terms of Geodetic latitude. (3)
  - the rectangular co-ordinates in terms of Geocentric latitude. (3)
  - the rectangular co-ordinates in terms of Reduced latitude. (2)

(OR)

- b. i. Establish the relationship for computing the mean radius of curvature at any point on the spheroid. (12)
- ii. On Everest spheroid, compute the mean radius of curvature for Tamil Nadu if the mean geodetic latitude is  $10^{\circ}30'00''N$  and the azimuth of the line joining a point at Kanyakumari and Chennai is  $35^{\circ}00'00''$ . (4)
14. a. Discuss in details, about the measurement of gravity and its reduction to Geoid. (16)

(OR)

- b.i. Define the terms: Geops and Spherops. (2)
- ii. What do you understand by 'Gravity anomaly and Gravity disturbance'. (4)
- iii. Bring out the gravimetric method of determining the Geoid and Deflection of vertical. (10)
15. a. Write a detailed note on transformation of celestial co-ordinates. (16)

(OR)

- b. It is proposed to investigate the possible use of two stars for an observation Program in our campus. Their declinations are  $12^{\circ}$  and  $21^{\circ}$ .
- i. If the stars are said to cross the prime vertical, compute their zenith distance and hour angle. (8)
- ii. If the stars are said to be elongated, compute their azimuth, zenith distance and hour angle. (8)
- (Derive the equations used)