Reg.No. | | | | | | | | | 98 |

COLLEGE OF ENGINEERING GUINDY
ANNA UNIVERSITY, CHENNAI -25

B.E. (Full Time) DEGREE END SEMESTER EXAMINATIONS, MAY/JUNE 2013

GEOINFORMATICS ENGINEERING BRANCH

FOURTH SEMESTER - (REGULATIONS 2008)

GI 9254 – ELECTRONIC SURVEYING

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. State the basic principle of Electromagnetic Distance Measurement.
2. What is modulation and why is it required?
3. What are transducers? In what context, it is used in Total station equipment.
4. Give the important properties of Electromagnetic waves.
5. Compute the group refractive index for light at standard conditions if the total station emits laser at 860nm.
6. Compute the second velocity correction for a distance of 50 Km, measured by the Microwave Total station equipment.
7. What is ground swing? How is it eliminated?
8. Distinguish between an electro-optical and micro wave total station.
9. State the temporary adjustments of the total station.
10. Mention the salient features of the instrument used by you for your practice.

PART - B (5x16 = 80Marks)

11. Discuss in detail, about the following terms used in Total station surveying:
    a. Missing Line Measurement (8)
    b. Remote Elevation Measurement (8)

----------continued in page 2

12. a. i. A Total station instrument operates with basic modulation frequencies of 14.90750 MHz and 15.14413 MHz. Compute the distance measured by the instrument if $N_2 = N_1 + 1$. (6)

ii. Discuss the merits and demerits of Electronic Surveying over Conventional Surveying. (10)

(OR)

12. b. i. Write about the transducers used in the modern Total station equipment. (10)

ii. Describe the reflector used in Electro-optical Total station equipment. (6)

13. a. i. What is group refractive index? Establish the relationship between group refractive index, phase refractive index and wavelength of the carrier. (8)

ii. Compute the velocity of microwave having the modulation frequencies of 33MHz at a temperature of 18.2 °C, an atmospheric pressure of 754.8 mmHg and a partial water vapour pressure of 4.5 mmHg. (8)

(OR)

13. b. i. What is first velocity correction? Deduce an expression for the same. (4)

ii. An Electro–optical Total station was designed with carrier wavelength of 910 nm at a temperature of 17.8 °C, and an atmospheric pressure of 750 mmHg. Compute the first velocity correction for the instrument at the temperature of 21 °C, and an atmospheric pressure of 758 mmHg. (12)

14. a. i. Outline the basic measuring principle of Microwave Total Station. (4)

ii. Discuss the different sources of error that are to be taken in to account while making measurements with Electro-optical Total station. (12)

(OR)

14. b. i. Write about the NAVSTAR GPS. (4)

ii. A microwave Total station was designed with modulation frequencies of 149.848300MHz and modulation wavelength of 2 m. Compute the error due to the variation of modulation frequency at the temperature of 28 °C, an atmospheric pressure of 711.2 mmHg and a partial water vapour pressure of 12.2 mmHg. (12)

15. a. i. How will you locate the position of the Total station with the known position of three points? (10)

ii. From the following data, compute the area enclosed by the points A, B, C and D

Corner	A	B	C	D
X co-ordinate(m)	2500.000	2717.098	2810.615	2621.820
Y co-ordinate(m)	2500.000	2455.832	3037.216	3066.516

(6)

(OR)

15.b. i. Bring out the computational procedure involved in Trilateration. (6)

ii. Explain the step by step procedures involved in Base line measurement with Total Station and its accessories. (10)