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

GEOINFORMATIC ENGINEERING BRANCH

FOURTH SEMESTER (Regulation 2012)

GI8451 Total Station and GPS Surveying

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What is Total Station? Illustrate its uses.
2. Describe GNSS receiver.
3. What are the factors affecting Refractive Index?
4. A Total Station employs GaAs diode emitting laser at 820nm. Compute the group refractive index at standard condition.
5. What are the precautionary measures to be taken while maintaining the total Station?
6. The distance measuring accuracy of Total Station shown in catalog as $\pm(1.5\text{mm}+2.5\text{ppm})$. What is the accuracy of measured distance 7998.154m by this Total Station?
7. Describe Anti Spoofing and Selective Availability?
8. Differentiate between broadcast ephemerides and precise ephemerides.
9. Write short notes on VLBI.
10. Why the elevation mask angle generally set to a value above 10° ?

Part – B (5 x 16 = 80 marks)

11. i. Explain working principles of EDM by phase difference method. (8)
ii. Discuss basic concepts of satellite geodesy. (4)
iii. Explain Kepler's first law of planetary motion. (4)
- 12a. i. What is second velocity correction? Derive an expression for (12)
determination of second velocity correction.
ii. A Total Station instrument operates with basic modulation of (4)
299.792477MHz and 299.852435MHz Compute the distance displayed by
instrument. (Note: $R_1 = R_2 = 0$)

(OR)

- 12b. i. Compute the modulated wave length of microwave having a modulation frequency of 10 MHz at a temperature of 15.4° C and an atmospheric pressure of 645mm of Hg and a partial water vapour pressure of 3.8mm of Hg. (8)
- ii. Derive an equation for determination of Group Refractive Index for light at standard condition. (4)
- iii. Discuss different offset methods employed in Total Station surveying. (4)
- 13a. i. Explain working principles of Microwave Total Station. (6)
- ii. Explain source of errors in Electro-optic Total Station. (10)
- (OR)
- 13b. i. Explain the procedure for Trilateration adjustment. (14)
- ii. Distinguish between an Electro-optical Total Station and microwave Total Station. (2)
- 14a. i. Discuss task of control segment. (6)
- ii. Explain various components of GPS receiver. Also discuss about different classification of GPS receivers (10)
- (OR)
- 14b. i. Discuss Space segment in NAVASTAR GPS system. (8)
- ii. Explain the NAVASTAR GPS signal structure in detail. (8)
- 15a. i. What is ambiguity? Explain in detail any one method solving the ambiguity problem. (6)
- ii. Write functional flow diagram of GPS software package. (8)
- iii. How many pseudo range observation epoch to be stored, if GNSS receiver switched on between 10^h 55^m32^s AM to 1^h 05^m52^s PM and the epoch stored at an interval of 5sec for 12 GNSS satellites. (2)
- (OR)
- 15b. i. List various applications of satellite geodesy. (4)
- ii. What are the different survey techniques employed in GNSS survey? Explain all methods in detail. (8)
- iii. Discuss about single differencing, double differencing and triple differencing. (4)