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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, May 2013
B.E. Geoinformatics
Semester V
GI 9301 surveying III
(Regulation 2008)

Duration 3 hours **Max marks 100**

Answer all questions
Part A (10x2=20marks)

1. Explain the meaning of Equation of Time
2. Explain celestial sphere.
3. Explain parallax and refraction correction.
4. Explain sidereal time.
5. What do you mean profile leveling
6. Explain the need for water route surveying.
7. What is meaning of sight distance in curve setting of roads.
8. Explain the importance of vertical curve setting.
9. Explain Digital terrain model
10. Explain the use of Gyro theodolite.

Part B (5 x 16 = 80 marks)

11(i) How would you make solar observations? **(4)**
(ii) Explain various corrections required for solar observations. **(4)**

(iii). In determining the azimuth of a line in Kolkata, observations was made to the sun and the following data were available.

Mean horizontal angle of the sun		
Clockwise angle from the reference line	=	47°07'30"
Mean observed altitude of the sun	=	10°03'00"
Declination of the sun at the		
Time of observation	=	180°30'00" South
Horizontal parallax	=	8".9
Refraction correction	=	57" cot α
Latitude of Kolkata	=	22°30' North

Calculate the azimuth of the line. **(8)**

12 a An observation for latitude was made at a place in longitude 7°20'15" W. The Meridian altitude of the sun's lower limb was observed to be 44°12'30", the sun being to the south of the zenith. Sun's declination at GAN was +22°18'12".8, Increasing at 6.82s per hour and semi-diameter of sun 15'45".86. Find the latitude of the place of observations. **(16)**

(or)

12 b At the station A, altitude of sun was observed in the morning of a certain date in the month of May, 2007 and the following data was recorded.

Corrected altitude of sun	=	43°38'00"
Declination of sun	=	+18°45'50" N

E.T to be subtracted from apparent time	=	3m 43s
Latitude of station	=	42°20' N
GMT of observation	=	16 h 22m 55 s

Find the longitude of station A. **(16)**

13 (a) (i) Explain the term apex distance and versine distance of a curve **(8)**

(ii) A curve of radius 600m with deflection angle 98° is to be set out by perpendicular offsets from the tangent. Tabulate the offset values till the offset is not more than 20m. The remaining curve has to be set from a new tangent from the last point set. Determine the direction of the new tangent or the point at which this tangent intersects the backward tangent point. **(8)**

(or)

(b) (i) Derive the expressions for the elements of a reverse curve. **(8)**

(ii) A curve of radius 400m and deflection angle 85° was to be set from offsets from the chords produced. The chainage of the first tangent point is 1002.35m. Calculate the first five offsets from the chords produced to set out the curve. **(8)**

14 a (i) Explain the principles of route surveying for highways and railways. **(8)**

(ii) Explain the use of digital theodolite and also explain its available accuracy. **(8)**

(or)

(b)(i) Explain the step-by-step procedure of tunnel alignment and setting out works. **(8)**

(ii) Explain how will you transfer Azimuth in mine surveying. **(8)**

15 (a) (i) Explain the principle and application of GPS. **(8)**

(ii) Explain Lidar measurement and its application **(8)**

(or)

15 (b)(i) Explain the complete procedure of surveying and mapping using Total station. **(8)**

(ii)Explain with field application the use of Electronic Level and Laser theodolite. **(8)**