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B.E./ B Tech (Full Time) END SEMESTER EXAMINATIONS NOV/ DEC 2011

**GEO INFORMATICS ENGINEERING BRANCH
THIRD SEMESTER**

**GI- 9201 SURVEYING – I
(REGULATIONS 2008)**

Time: 3hrs

Max Marks: 100

Instructions:

1. Draw neat sketches wherever necessary.
2. Assume suitable data wherever required.
3. Answer all questions in Part A and Part B respectively.

Part – A (10 x 2 = 20 Marks)

1. What are the different sources of errors in surveying?
2. Draw a neat sketch of a device used for setting out right angles?
3. If the ground rises by 5 m in a chain length of 20m, determine the slope correction.
4. A line AB was drawn to have a magnetic bearing of $25^{\circ} 30'$ in 2010 when the declination was $2^{\circ} 30'E$. Determine the magnetic bearing of the line if the present declination is $5^{\circ} 30' W$.
5. What is local attraction? How would you detect it at a place?
6. List the instruments and accessories used in plane tabling.
7. The reduced level of a factory floor is 30.500m. The staff reading on floor is 1.610m and the staff reading when the staff is held inverted with bottom touching the tie beam of the roof truss is 3.700m. Find the height of the tie beam above the floor.
8. A light house is visible just above the horizon from a ship. If the height of the light house is 200m, determine the distance between the light house and the ship.
9. If the sensitivity of the bubble tube of a levelling instrument is 30" per 2mm division. Find the error in the staff reading on a staff held at a distance of 100m caused by the bubble being two divisions out of the centre.
10. How would you determine the area of a polygon by co-ordinate method?

Part - B (5 x 16 = 80 Marks)

11. In a proposed hydro -electric project, a storage reservoir was required to provide storage of 4.5 million m^3 between the lowest draw down (LDD) and the top water level (TWL). The area contained within the stated contours and upstream faces of the dam were as follows:

Contour (m)	100	95	90	85	80	75	70	65
Area (ha)	30	25	23	17	15	13	7	2

If LDD was to be 68 m, Calculate TWL for a) Full Storage Capacity b) 60% full storage capacity. Use end area method for calculating volumes.

(P.T.O)

12. a.i) What is plane surveying? How is it different from geodetic surveying? (8)
 ii) Bring out the basic principles of Surveying? (8)

(Or)

- b.i) What is ranging? Explain the method of reciprocal ranging? (6)

- ii) A Steel tape is 30 m long while lying on the flat at a temperature of 27° C under a pull of 45 N. The tape is stretched over two supports and also supported at two intermediate supports equally spaced. All the supports are at the same level and the tape is allowed to sag freely between the supports. If the temperature in the field is 32° C and the pull applied on the tape is 75 N, calculate the actual length at mean sea level if the measurement was made at an elevation of 1000 m above mean sea level.

Area of the cross section of the tape	= 7 mm ²	
Mass of the Tape	= 1.60kg	
Coefficient of expansion	= 1.1 x 10 ⁻⁵ / °C	
Young's Modulus	= 2x10 ⁵ N / mm ²	
Radius of the earth	= 6370 km	(10)

13. a.i) What is an offset? Mention the different types of offset and explain the swing offset. (6)
 ii) In chaining an area containing pond, two points C and D were selected in either sides of the Point A such that A,C and D are collinear. The point B, which is on the other side of pond, is on the survey line AB. If the distances AC, AD, BC and BD are 35m, 45m, 100m and 95 m respectively, determine the length of the survey line AB and the angles which the inclined line CD makes with the survey line AB. (10)

(Or)

- b. i) Explain the Bowditch rule for adjusting a compass traverse. (6)

- ii) The following are the observed bearings with a surveyor's compass, where local attraction was suspected. Find the corrected bearings of the lines and also calculate the included angles. (10)

Line	Fore Bearing	Back Bearing
PQ	S 45° 30' E	N 45° 30' W
QR	S 60° 00' E	N 60° 30' W
RS	N 03° 30' E	S 05° 30' W
SP	N 85° 00' E	S 83° 30' W

- 14.a i) Define the terms used in plane table surveying: Orientation, Radiation and Resection (6)
 ii) What is a two point problem? Describe the procedure in detail. (10)

(Or)

- b. The following consecutive readings were taken with a dumpy level and 4m levelling staff on continuously sloping ground at 30m intervals
 0.680, 1.455, 1.855, 2.330, 2.885, 3.380, 1.055, 1.860, 2.265, 3.540, 0.835, 0.945, 1.530 and 2.250m.

Rule out a page of level field book and enter the above readings. Reduce the level of the last point by collimation method if the reduced level of the first point is 80.750m. Also determine the gradient of the line joining first and last point.

15. a. What is profile levelling? Describe the procedure for conducting profile levelling of a proposed highway.

(Or)

- b.i) What are the different sources errors in levelling? How would you minimize the same? (6)
 ii) What is reciprocal levelling? How would you determine the correct difference of levels of two points on the opposite banks of a river? (10)