

B.E. (Civil) Part II 3rd Semester Final Examination, 2011
Subject: Surveying I (CE 301)

Time: 3 Hours

Full Marks: 70

Use separate answer-script for each half.
The figure within the bracket indicates full marks.
Two (2) marks are reserved for neatness in each half.
Answer THREE (3) questions from each half.

FIRST HALF

1. Find closing error in a theodolite traversing, if AB = 101 m, N45E; BC = 99 m, CD = 102 m and DA = 98 m. The angles in degree are A = 90.5, B = 89.75, CD = 90.25 and D = 89.0.

(11)
2. The staff readings on a sloping ground are 4.00, 2.50, 1.00, 3.67, 2.19, 3.17, 1.68 and 0.12 m. Instrument has been shifted after 3rd and 5th reading. Tabulate BS, IS, FS, Rise, Fall and checks arithmetically. Find the last RL if the first RL is 60.0 m AMSL.

(11)
3. Chainage of starting a simple curve of radius 250 m is 1000 m. The chainage of the intersection triangle is 1100 m. Calculate the offsets to the curve from chainage 1025, 1050 and 1075 m. Draw sketch.

(11)
4. Briefly explain (any two).
 - (i) Use of theodolite in land surveying
 - (ii) Principle of leveling
 - (iii) Various road/rail curves

(11)
5. Write short notes on the followings (any three).
 - (i) Departure
 - (ii) Benchmark
 - (iii) Setting out
 - (iv) Sensitivity
 - (v) Bowditch Rule

(11)

SECOND HALF

6. (a) Discuss the different methods of horizontal distance measurement.

(b) A steel chain was exactly 30 m long at 20°C when supported throughout its length under a pull of 12 kg. A survey line was measured with this chain under a pull of 16 kg and at a mean temperature of 31°C and it was found to be 300 m. The cross-sectional area of the chain = 0.03 cm², and its total weight = 0.750 kg. α for steel = 11×10^{-6} per °C and E for steel = 2.1×10^6 kg/cm². Compute the true length of the line if the chain was supported during measurement at every 30 m.

(4+7=11)

7. (a) P and Q are two points 367.0 m apart on the same bank of a river. The bearings of a tree on the other bank observed from P and Q are N36°25'E and N40°35'W, respectively. Find the width of the river if bearing of PQ is S86°35'E.

(b) The distances along a sloping ground were measured with 30.0 m chain were 28.7, 23.4, 20.9 and 29.6 m respectively and the corresponding slope angles were found to be 3°, 5°, 7°, 10° respectively. It was noted afterwards that the chain was 0.025 m too short. Find the true horizontal distance.

(6+5=11)

8. What is meant by plane tabling? When do you recommend it? What are the accessories required in a plane table survey? How do you orient the table in plane table survey? Also describe one of the methods briefly.

(1+1+2+2+5=11)

9. (a) What is closing error? Explain the Bowditch's rule in view of closing error.

(b) The following bearings were taken in traversing with a compass in a place where local attraction was suspected.

Line	Fore Bearing	Back Bearing
PQ	191°30'	13°00'
QR	69°30'	246°30'
RS	32°15'	210°30'
ST	262°45'	80°45'
TP	230°15'	53°00'

At what station(s) do you suspect local attraction? Determine the corrected bearings.

(5+6=11)

10. Write short note on the followings

- (a) Reconnaissance survey and index sketch
- (b) Two-point problem
- (c) Methods of traversing

(3+5+3=11)