

**B.E (Civil) Part-II**  
**3<sup>rd</sup> Semester Final Examination, 2007**  
**Subject: Surveying - I**

Code No.: CE: 301  
Branch: Civil Engineering

Time: 3 Hours.

Use separate Answer script for each half.

Full Marks: 70

**FIRST HALF**

(Answer Q. No. 1 and any TWO from the rest)

1. Answer any three question: (3 X 5 = 15)
- a) What is slope rails or batter boards? Briefly describe its use in setting out works.
  - b) Write in brief about "Profile leveling".
  - c) Describe the of Curvature in leveling.
  - d) Describe in brief about construction and protection of control points in setting out works.
  - e) Describe in brief about the importance of change point or turning point in differential levelling.
2. a) Define "Back Sight" and "Height of Instrument" in levelling.
- b) The following staff readings were observed successively with level, the instrument having been moved forward after the second, fourth and eighth readings: **0.865, 1.135, 2.110, 1.345, 2.830, 3.025, 4.105, 0.120, 1.875, 2.030, 3.675.**
- The first reading was taken with the staff held upon a benchmark of elevation 132.135. Enter the readings in level-field book and reduce the levels. Apply the necessary checks. Find the gradient joining the first and the last point assume that a 20m. chain has been used. (2+8 = 10)
3. What are face left and face right condition? State the important relationship of the geometric features of a transit theodolite. Describe the measurement of horizontal angle by method of repetition. (2+3+5 = 10)
4. a) Explain graphically what is closing error in a closed traverse. State transit rule and Bowditch rule for adjustment of a closed traverse.
- b) An abstract from a traverse sheet for a closed traverse is given below.

Line	Length (m.)	Azimuth
AB	350	152°46'12"
BC	580	64°50'54"
CD	360	01°10'06"
DE	380	265°08'48"
EA	400	231°22'00"

Balance the traverse by Bowditch rule.

(2+1+2+5 = 10)

SECOND HALF

(Answer Q.No.1 and any TWO from the rest)

5. *X*. Answer any three questions:

(3 × 5 = 15)

- i) Why the part to whole principle is not followed in surveying?
- ii) Describe briefly how plane surveying differs from geodetic surveying?
- iii) What is positive cumulative error? Write the reasons for which these types of errors are occurred.
- iv) Why are the letters E and W interchanged from their true positions in case of Surveyor's Compass?
- vi) Discuss the advantages and disadvantages of Plane table surveying.

6. *Z*. (a) Determine the limiting length of offset in Chain surveying if the errors occur in length and direction combined? (4)

(b) There is an obstacle in the form of a pond on the main chain line AB. Two points C & D were taken on the opposite side of the pond. On left of CD, a line CE was laid out 100m in length and a second line CF, 80m long was laid out on the right CD such that E, D and F are in the same straight line. DE & DF were measured and found to be 62m and 59m respectively. Find out the obstructed length CD. (6)

7. *B*. (a) What is meant by variation of declination? Explain the different types of variation of declination. (4)

(b) The bearing of one side of a regular hexagon is 45°. Calculate the bearings of the remaining side, taking the sides in clockwise order. (6)

8. *A*. (a) Explain the suitability of Plane table surveying (3)

(b) What is two-point problem? Describe the procedure in detail. (7)

Line	Length (m)
AB	100
BC	80
CD	62
DE	59