Ex/BESUS/CE-301/09

B.E. (CE) Part-II 3rd Semester Examination, 2009

Surveying-I
(CE-301)

Time : 3 hours   Full Marks : 70

Use separate answerscript for each half.

FIRST HALF
(Answer Q.No.4 and any TWO from the rest.)

1. The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings:

   2.228, 1.609, 0.989, 2.091, 2.864, 1.262, 0.602, 1.982, 1.045 and 2.685 metres.

   Enter the above readings in a page of a level book and calculate the R.L. of points if the first reading was taken with a staff held on a bench mark of 432.384 m. Apply the usual checks.   [8+2]

2. a) In levelling between two points A and B on opposite banks of a river, the level was set up near A, and the staff readings on A and B were 1.564 and 2.934 respectively. The level was then moved and set up near B and the respective readings on A and B were 1.895 and 3.271. Find the true difference of level between A and B. If R.L. of A is 180.855 find out the R.L of B.

   b) For the above problem find :
   (i) The combined correction for curvature and refraction,
   (ii) The error in the collimation adjustment of the instrument. The distance between the points A and B is 1200 m.   [5+(2+3)]

3. a) Describe concisely the components of a plane table out fit. Explain how you would set up and orient the plane table.

   b) Name the methods of plane table survey. Describe, in brief, any one method.
                                                                                                        [5+5]

4. Write short notes on <u>any three</u> of the following: [3×5]
   a) Curvature and refraction corrections in levelling,
   b) Reciprocal ranging,
   c) Datum, Height of instrument, Line of collimation,
   d) Level book,
   e) Change point.

SECOND HALF

(Answer Q.No.8 and any TWO from the rest.)

6. a) A 50 m tape is suspended between the ends under a pull of 15 kg. The weight of the tape is 1.5 kg. Find the corrected length of the line connecting the ends.

    b) A and B are two points 150 m apart on the nearer bank of a river, which flows east and west. The bearings of the tree on the other bank of the river as observed from A and B are N. 30° E. and N. 45° W. Find the width of the river.

    [5+5]

6. a) During traversing a pentagon following bearings were obtained where local attraction was suspected. Find the true bearings of the lines assuming the magnetic declination of the place to be 8° East.

Line	Fore bearing	Back bearing
AB	190°40′	13°00′
BC	39°30′	222°30′
CD	22°10′	199°00′
DE	242°45′	62°45′
EA	330°10′	148°00′

    b) What is meant by traverse surveying? How does it differ from chain surveying?

    [6+4]

7. What are the different methods of calculating the area? Compare the relative accuracy of the methods.

    Deduce the expression for computation of area by Simpson's rule. The following perpendicular offsets were taken (in metre) at 10 m intervals from a survey line to the boundary of a garden.

    Distance in m : 0 6 12 18 24 36 48 60 72 81 90
    Offset in m   : 3.60 3.00 2.40 1.80 1.20 1.50 2.10 2.40 3.00 3.30 3.90

    Calculate the are enclosed between the survey line, the boundary of the garden and the end offsets by (a) Simpson's rule, and (b) the Trapezoidal rule.   [2+3+5]

8. Answer <u>any three</u> of the following: [3×5]

    a) Define the terms: Base line, Tie line, Check line.

    b) What is closing error in a closed traverse? How would you adjust it graphically?

    c) Describe a field book and show how the field measurement are recorded in it?

    d) Reciprocal ranging

    e) Reconnaissance survey.

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