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Question Paper Code : 71549

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Third Semester

Civil Engineering

CE 6304 — SURVEYING I

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write short notes on ranging.
2. Differentiate between Engineer's chain and revenue chain.
3. Define true and magnetic bearing.
4. What are the various types of variations in declination?
5. What are the different methods of levelling?
6. Define : (a) Fore sight (b) Back sight .
7. Define : Horizontal Equivalence.
8. What are the uses of contour?
9. What are the uses of tacheometry?
10. What is the Well conditioned triangle?

PART B — (5 × 13 = 65 marks)

11. (a) A steel tape of nominal length 30 m was suspended between supports to measure the length of a line. The measured length of the line on a slope of angle $3^{\circ}50'$ is 29.859 m. The mean temperature during the measurement was 12°C and the pull applied was 100 N. If standard length of the tape is 30.005 m at 20°C , and the standard pull is 45 N, calculate the corrected horizontal length. Take weight of the tape = 0.15 N/m, its cross sectional area 2.5 mm^2 , $\alpha = 1.15 \times 10^{-5}$ per $^{\circ}\text{C}$ and $E = 2.0 \times 10^5 \text{ N/mm}^2$. (13)

Or

- (b) Explain the classification of surveying. (13)

12. (a) The following bearings were observed in running a closed traverse

| Line | F.B | B.B |
|------|----------|----------|
| AB | 124° 30' | 304° 30' |
| BC | 68° 15' | 246° 00' |
| CD | 310° 30' | 135° 15' |
| DA | 200° 15' | 17° 45' |

At what stations do suspect local attraction? Find the corrected bearing of the lines and also compute the included angles. (13)

Or

- (b) The following bearings were observed in running a closed traverse

| Line | F.B | B.B. |
|------|----------|----------|
| AB | 80° 10' | 259° 00' |
| BC | 120° 20' | 301° 50' |
| CD | 170° 50' | 350° 50' |
| DE | 230° 10' | 49° 30' |
| EA | 310° 20' | 130° 15' |

Mention which stations were affected by local attraction and determine the corrected bearing. (13)

13. (a) The following consecutive readings were taken along AB with a 4m levelling staff on a continuously sloping ground at an interval of 20m. 0.345 on A, 1.450, 2.630, 3.875, 0.665, 1.745, 2.965, 3.945, 1.125, 2.475, 3.885 on B. The first reading was taken on the staff held on the B.M of R.L 60.350m. Calculate the R.L of the points and also find the gradient of line AB. (13)

Or

- (b) The following consecutive reading were taken with a dumpy level. 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030, 3.765. The instrument was moved after second, fourth and eighth readings. The first reading was taken on the staff held on the B.M of R.L 132.135m. Calculate the R.L of the points and apply the arithmetical check. (13)

14. (a) Determine the area for the following observations by (i) Trapezoidal rule (ii) Simpson's rule (13)

| Ordinate : | O ₁ | O ₂ | O ₃ | O ₄ | O ₅ | O ₆ | O ₇ | O ₈ | O ₉ |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Distance (m) : | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| Offset (m) : | 10.6 | 15.4 | 20.2 | 18.7 | 16.4 | 20.8 | 22.4 | 19.3 | 17.6 |

Or

- (b) A series of offsets were taken from a chain line to a curved boundary line at intervals of 15 m in the following order. 0, 2.65, 3.80, 3.75, 4.65, 3.60, 4.95, 5.85m. Compute the area between the chain line, the curved boundary and the end offsets by (i) average ordinate rule (ii) Trapezoidal rule and (iii) Simpson's rule. (13)

15. (a) The elevation of a point P is to be determined by observations from two adjacent of a tacheometric survey. The staff was held vertically upon the point, and the instrument is fitted with an anallactic lens and the constant is 100. Compute the elevation of the point P from the following data, taking both the observations as equally trustworthy

| Ins. station | Height of axis | Staff station | Vertical angle | Elevation of station | Staff reading |
|--------------|----------------|---------------|----------------|----------------------|---------------------|
| A | 1.42 | P | +2°36' | 77.750 m | 1.230, 2.055, 2.880 |
| B | 1.40 | P | -3°36' | 97.135 m | 0.785, 1.800, 2.815 |

Also, calculate the distance of A and B from P. (13)

Or

- (b) To determine the multiplying constant of a tacheometer, the following observations were taken on a staff held vertically at distance, measured from the instrument.

| Observation | Horizontal distance in m | Vertical angle | Staff reading |
|-------------|--------------------------|----------------|---------------|
| 1 | 50 | +3°48' | 0.500 |
| 2 | 100 | +1°06' | 1.000 |
| 3 | 150 | +0°36' | 1.500 |

The focal length of the glass is 20cm and the distance from the object glass to trunnion axis is 10 cm. The staff is held vertically at all these points. Find the multiplying constant. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Describe with the help of sketches the characteristics of contour. (15)

Or

- (b) Explain in detail about the traversing method adopted for a river and a lake with suitable sketch. (15)