USN ☐☐☐☐☐☐☐☐☐☐

18CV35

Third Semester B.E. Degree Examination, July/August 2021
Basic Surveying

Time: 3 hrs.   Max. Marks: 100

Note: **1.** *Answer any FIVE full questions.*
2. *Assume any missing data suitably.*
3. *Draw sketches wherever necessary.*

1 a. State atleast three differences between:
   (i)   Plane survey and geodetic survey
   (ii)   Accuracy and precision   **(06 Marks)**
   b. Length of a line measured with 20.0 m chain was 1341.0 m. The same line when measured with 30.0 m chain, which was 20 cm tooshort was found to be 1350.0 m. What was the error in 20 m chain?   **(06 Marks)**
   c. To continue a line $\overline{AB}$ post an obstacle, a line $\overline{BC}$ measuring 200 m was set out perpendicular at B to $\overline{AB}$. From point 'C' ∠BCD = 60° and ∠BCE = 45° were set. Determine $\overline{CE}$ and $\overline{CD}$ such that points A, B, E and D are in a straight line. Also calculate the obstructed distance $\overline{BE}$.   **(08 Marks)**

2 a. List three parameters under which surveying is classified.   **(06 Marks)**
   b. Brief the working principle of and EDM with sketch.   **(06 Marks)**
   c. A line was measured with a steel tape which was exactly 30 m at a temperature of 20°C and pull of 10 kg. the measured length was 1650 m. The temperature during measurement was 30°C and applied pull was 15 kg. Find the true length of line, if cross sectional area of the tape was 0.025 cm^2. Coefficient of thermal expansion of the tape is 3.5×10^{-6}/°C, $E = 2.1 \times 10^6$ kg/cm^2.   **(08 Marks)**

3 a. Compare between prismatic and surveyor's compass for atleast six differences.   **(06 Marks)**
   b. What is meant by local attraction? How is it detected?   **(06 Marks)**
   c. The following bearings are observed in a closed traverse. Determine the correct bearings of lines affected by local attraction. Tabulate the results.

Line	AB	BC	CD	DA
FB	32°30′	124°30′	181°0′	289°30′
BB	214°30′	303°15′	1°0′	108°45′

(08 Marks)

4 a. Mention the differences (at least two) between:
   (i) WCB and QB   (ii) Dip Declination   (iii) Magnetic bearing and True bearing   **(06 Marks)**
   b. Explain how closing error is adjusted by Bowditch's Transit rule.   **(06 Marks)**
   c. Length and bearings of a compass traverse ABCD are given below. The length and bearing of line DA is omitted due to obstruction. Calculate the same.

Length m	AB	BC	CD
Length m	485	1720	1050
Bearing	342°	16°	140°

(08 Marks)

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5 a. Define the following terms with respect to leveling:
   (i) Bench mark   (ii) Elevation   (iii) Height of collimation
   (iv) Change point   (v) Back sight   (vi) Station   **(06 Marks)**

   b. Describe in sequence, the temporary adjustments to a dumpy level while starting leveling work.   **(06 Marks)**

   c. Following details were recorded in level work. Calculate:
   (i) True RL of point B
   (ii) Angular error in collimation
   (iii) Combined correction for curvature and refraction

Inst. At	Staff Reading on		Remarks
	A	B	
A	1.030	1.630	AB = 800.00 m
B	0.950	1.540	RL of A = 450.00

      (08 Marks)

6 a. State the different methods of leveling. Explain any one method.   **(06 Marks)**

   b. Enumerate profile leveling in detail with sketch.   **(06 Marks)**

   c. Following readings were taken consecutively with 4.00 m level staff and a level on a sloping ground at a common interval of 5.0 m. Calculate the R.L of all points by Rise and Fall method. Determine the gradient between First and last point. Apply usual check. A reading 0.780 is observed on a BM of 180.750 m.
   1.535, 1.955, 2.430, 2.985, 3.640, 0.935, 1.045, 1.630, 2.480, 3.480, 1.550, 1.960 and 2.225.   **(08 Marks)**

7 a. Name the Accessories used in plane table surveying. Mention their uses.   **(08 Marks)**

   b. Write a note on "orientation". Explain the two methods adopted for orienting a plane table.   **(12 Marks)**

8 a. State the advantages and disadvantages of plane table surveying.   **(08 Marks)**

   b. Describe the method of Resection by Bessel's three point graphical method.   **(12 Marks)**

9 a. What is a "Contour" in surveying? List atleast four characteristics of a contour.   **(06 Marks)**

   b. Perpendicular offsets are taken at 10.0 m interval along a Base line to an irregular boundary line. Calculate the area enclosed by boundary line and base line between First and Last offset by (i) Trapezoidal rule   (ii) Simpson's rule.   **(06 Marks)**

   c. Explain "Mid ordinate" of calculating area of an irregular shaped plot in plan.   **(08 Marks)**

10 a. What is palnimeter? Explain the polar planimeter along with essential parts.   **(12 Marks)**

   b. A Railway embankment is 10 mt wide with side slopes 1½ :1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120 mt, the centre heights at 20 mt intervals being in meters.
   2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5
   Use Trapezoidal and Prismoidal rules.   **(08 Marks)**

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