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**BCE-031**

# DIPLOMA IN CIVIL ENGINEERING
## DCLE(G)

00387

## Term-End Examination

## December, 2017

## BCE-031 : ADVANCED SURVEY

*Time : 2 hours* *Maximum Marks : 70*

***Note :*** *Question no. 1 is* ***compulsory.*** *Attempt any* ***four*** *questions from the remaining. Use of scientific calculator is permitted. Assume missing data, if any, suitably.*

**1.** Select the most appropriate answer for each of the following multiple choice questions : *7×2=14*

(a) The two-theodolite method of setting out a curve requires

(i) Tape and theodolites

(ii) Only theodolites

(iii) Only tape

(iv) None of the above

(b) In a tacheometer, the number of stadia hairs is

(i) Four

(ii) Three

(iii) Two

(iv) One

(c) The sum of included angles of a closed traverse having 'n' number of sides is equal to

(i) $(n - 4)\ 90$

(ii) $(n + 4)\ 90$

(iii) $(2n - 4)\ 90$

(iv) $(2n + 4)\ 90$

(d) A curve of varying radius introduced between a straight and circular curve is known as

(i) Simple curve

(ii) Reverse curve

(iii) Transition curve

(iv) Compound curve

(e) In linear measurement, greater accuracy can be obtained by

(i) Theodolite

(ii) Chaining

(iii) Direct tape measurement

(iv) Tacheometer

(f) The curvature of the Earth's surface is taken into consideration, if extent of survey is more than

(i) 260 sq. km

(ii) 360 sq. km

(iii) 200 sq. km

(iv) 300 sq. km

(g) Least count of vernier theodolite is

(i) 1/2 degree

(ii) 1 degree

(iii) 50 seconds

(iv) 20 seconds

**2.** (a) Explain the basic principle of a traverse survey. Also explain the types of traverse. *4*

(b) In a closed traverse survey ABCDE, the observed bearing of line AB is 120°30′0″. The included angles measured are as follows :

| Station | Included Angle |
|---|---|
| A | 76°49′00″ |
| B | 150°20′40″ |
| C | 98°20′30″ |
| D | 102°15′40″ |
| E | 112°14′10″ |

Calculate the bearing of remaining sides of the traverse (refer figure 1). *10*

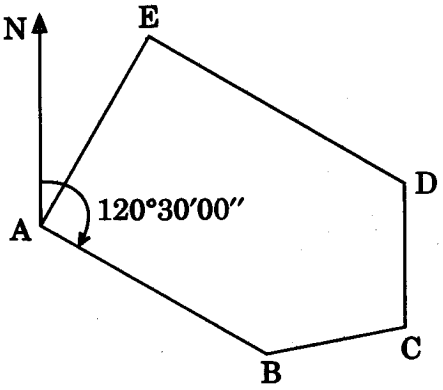


*Figure 1*

3. (a) What are the constants of a tacheometer and how are they determined ? Explain with example.

(b) Differentiate between the fixed hair and movable hair methods. Discuss the advantages and disadvantages of each method. *2×7=14*

4. (a) What are the different types of vertical curves ? What is the use of having a vertical curve as a parabola ? Describe. *4*

(b) A vertical curve has an upgrade of 1·4% followed by a downward grade of 1%. The rate of change of grade is 0·12% per chain of 20 m. Calculate the length of the vertical curve. *10*

5. (a) Differentiate between Micro Optic and Electronic theodolites.

(b) Define selective availability, anti-spoofing and geometric dilution of precision. *2×7=14*

6. (a) What is Project Survey ? Describe the various steps involved in it.

(b) What is Geodetic Triangulation ? Describe the method of triangulation. *2×7=14*

7. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) PRN Codes

(b) Closing Error

(c) Subtense Bar

(d) City Survey

(e) Latitude and Departure

(f) Total Station

(g) Reciprocal Levelling