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BCE-031

DIPLOMA IN CIVIL ENGINEERING
DCLE(G)

Term-End Examination

December, 2015

BCE-031 : ADVANCED SURVEY

Time : 2 hours *Maximum Marks : 70*

Note : *Question number **1** is **compulsory**. Attempt any **four** questions from the remaining. All questions carry equal marks. Use of scientific calculator is permitted.*

1. Choose the correct alternative : *7×2=14*

(a) The sum of internal angles in closed traverses with n stations should be

(i) $180(n - 2)°$

(ii) $180(n + 2)°$

(iii) $180°$

(iv) $360°$

(b) Tangential method is related with

(i) Trigonometrical survey

(ii) Tacheometry

(iii) Chaining

(iv) Traversing

(c) The methods of levelling in which the relative elevations of different points on the Earth's surface are determined from observed vertical angles and known horizontal distances are known as

(i) Profile levelling

(ii) Barometric levelling

(iii) Trigonometrical levelling

(iv) Contouring

(d) A curve composed of two arcs of different radii having their centres on the opposite sides of the curve is known as

(i) Simple curve

(ii) Compound curve

(iii) Transition curve

(iv) Reverse curve

(e) EDM is used to measure

(i) Distance

(ii) Angle

(iii) Bearing

(iv) Slope

(f) Sounding method is used in

(i) City survey

(ii) Hydrographic survey

(iii) Aerial survey

(iv) Chain survey

(g) If L is the length of a line and θ is the Reduced Bearing, the latitude of the line will be

(i) $L \tan \theta$

(ii) $L \sin \theta$

(iii) $L \cos \theta$

(iv) $L \cot \theta$

2. (a) Discuss the various types of adjustments used in theodolite. 7

(b) A closed traverse was conducted round an obstacle and the following observations were made. Work out the length and bearing of DA. 7

Line	Length (m)	Bearing
AB	500	100°
BC	625	30°
CD	475	300°
DA	?	?

3. (a) Derive an expression for the horizontal distance of a vertical staff from a tacheometer, if the line of sight of the telescope is horizontal. 7

(b) The following observations were taken on a staff held vertically at a distance measured from the instrument :

Observation	Horizontal distance in metres	Vertical angle	Staff intercept
1	60	5°	0·600 m

The focal length of the object glass is 22 cm and the distance from the object glass to the trunnion axis is 8 cm. Find the multiplying constant. 7

4. (a) Describe the basic principles of trigonometrical levelling. 7

(b) An instrument was set up at A and the angle of depression to a vane 3 m above the foot of the staff held at B was 6°. The horizontal distance between A and B was known to be 2500 metres. Determine the R.L. of the staff station B. It is given that the staff reading on a B.M. of elevation 500 m was 3·0 m. 7

5. (a) What do you mean by a Transition curve ? Explain its requirements and advantages. 7

(b) Two tangents intersect at a chainage of 1200 m having deflection angle of 70°. If the radius of the curve to be laid is 400 m, calculate the length of the curve, tangent length and length of the long chord. 7

6. (a) Explain the principle of electronic distance measuring equipment. 7

(b) Define "Global Positioning System". Describe the various jobs performed by GPS equipment. 7

7. (a) Describe the various stages of conducting field surveys for any engineering project. 7

(b) Discuss some applications of aerial photographs. 7

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

(a) Vertical Curve

(b) Traverse Balancing

(c) Degree of Curve

(d) Reciprocal Levelling

(e) Components of a Simple Curve

(f) Signals in Surveying