

B.C.E 2nd YEAR 2nd SEMESTER EXAMINATION, 2017 (Old)
(1st / 2nd Semester / Repeat / Supplementary / Annual / Biannual)

SUBJECT: SURVEYING-II

(Name in full)

Full Marks: 100

Time: ~~Two hours~~/Three hours/~~Four hours~~/ ~~Six hours~~

(50 marks for each part)

Use a separate Answer-Script for each part

| Question No. | Part-I | Marks |
|--------------|---|--------|
| | Answer Question-1 and 2 and any <i>Two</i> questions from the rest | |
| Q.1) A) | <p>Fill in the blanks with appropriate word(s):</p> <p>a) The distance between the mid-point of the long chord and the apex of a simple curve is called</p> <p>b) A vertical curve ofconfiguration is not usually considered for complicacy of calculation.</p> <p>c) The angle between the original tangent and the tangent common to both transition and circular curve is called</p> <p>d) The sounding stations are located by for deep seas.</p> <p>e) The maximum superelevation recommended under normal condition for narrow gauge railway track is mm.</p> <p>f) In tunnel survey short vertical depths are measured by</p> | 1*6=6 |
| B) | <p>State whether the under-mentioned statements are True or False with necessary justifications:</p> <p>a) Reverse curve is not suited for meandering path of hilly areas.</p> <p>b) Direct line method is recommended for locating the sounding stations when they are scattered over the water body.</p> <p>c) Simm's method is followed for transference of levels in the tunnel.</p> | 2*3=6 |
| Q.2) | <p>a) Establish the fundamental expression for computing the deflection angle for nth peg on a simple circular curve required for "Double Theodolite Method" of setting out of simple curve.</p> <p>b) Deduce the necessary expression for forward tangent length (T_r) of a compound curve comprising two simple circular arcs.</p> | 6 6 |

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| No. of Question | Part-II | Ma |
|-----------------|---|--------|
| Q.3) | <p>c) Describe the “Weisbach Triangle Method” of transferring the surface centerline underground eliminating the chances of inaccurate bisection.</p> <p>A simple curve is to be introduced in between two straight lanes meeting at a chainage of 779.45m. The angle of intersection for the straights is given as 22°54'. The radius of simple curve is fixed at 225.7m. Set out the simple curve by the method of “Tangential Angle” using a theodolite of 20" least count.</p> | 1 |
| Q.4) | <p>A transition curve is to be inserted between a tangent and the circular curve in connection with the construction of a highway. The following data are provided for setting out of the curve.</p> <ol style="list-style-type: none"> i. Deflection Angle (Δ)= 63°49' ii. Maximum speed of the vehicle= 86 Kmph iii. Centrifugal Ratio= 0.25 iv. Maximum rate of change in radial acceleration= 0.3m/sec³ <p>Calculate: i) Radius of the circular curve ii) Length of the transition curve iii) Shift of the circular curve iv) Total tangent length</p> | 2+2-4= |
| Q.5) | <p>An observer taking soundings from a boat (O) wished to locate his position and measured with a sextant the angles subtended at (O) by three points A, B and C on the shore. The length AB and BC were scaled from the map and found to be 207m and 265m respectively and the angle $\angle ABC$ was 123°48'. The observed angles $\angle AOB$ and $\angle BOC$ were 34°52' and 42°37' respectively. What are the distances of (O) from A, B and C?</p> | 1 |

B.CIVIL ENGG. 2nd YEAR 2nd SEM. EXAMINATION 2017(OLD)

SURVEYING - II

Time: Three hours

Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

Part-II

Question no. 1 is compulsory

Answer any **two** from the rest*(Assume any data, if required, reasonably)*Marks
each part

Ma

1. Write short notes on the following (any four): (4×5) = 20

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- I. Different parts of telescope of a theodolite
- II. Graphical method of closing error adjustment of a theodolite traverse
- III. Name the fundamental axes of a theodolite
- IV. Temporary adjustment in theodolite survey
- V. Least count of a theodolite
- VI. Spire test in the permanent adjustment of a theodolite
- VII. The tangential method of tacheometric survey

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2+2+

4=]

2.

The bearings of AB and BC are $20^{\circ} 16'$ and $58^{\circ} 24'$, respectively. The coordinates of A and C are as follows (in meters)

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| Point | Northing | Easting |
|-------|----------|---------|
| A | 300 | 400 |
| C | 1430 | 1260 |

Compute the lengths of AB and BC and length and bearing of AC.

3.

The following is the data related to observations made on a vertically held staff with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100.

| Inst. Stn. | Height of inst. from G.L. | Staff stn. | W.C.B. | Vertical angle | Staff readings in m. | Remarks |
|------------|---------------------------|------------|---------|----------------|----------------------|-------------------------|
| O | 1.56 m. | A | 12° 25' | 00° 00' | 1.88, 2.25, 2.62 | R.L. of O = 130.25 m |
| | | B | 60° 45' | + 15° 10' | 1.83, 2.15, 2.47 | |

Calculate the distance AB, and the reduced levels of A and B.

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4.

Following are the lengths and bearing of traverse ABCDA. The bearings are referred to the magnetic meridian, and the magnetic declination is 5° 30' W. Convert the observed bearings to true bearings and find the error of closure.

| Line | Length in m | Bearing |
|------|-------------|----------|
| AB | 470 | 343° 52' |
| BC | 635 | 87° 50' |
| CD | 430 | 172° 40' |
| DA | 563 | 265° 12' |

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