

SURVEYING - II

Time: Three hours

Full Marks 100
(60 marks for ~~part~~ ^{this} part)

Use a separate Answer-Script for each part

Part-I

Question no. 1 is compulsory

Answer any **two** from the rest*(Assume any data, if required, reasonably)*1. Write short notes on the following (any five): (5×4) = 20

- I. Sequential field works to be done in triangulation survey
- II. 'Phase error' of cylindrical signals in triangulation survey
- III. The Subtense bar method in tacheometric survey
- IV. Relations between the fundamental axes to be a proper condition theodolite
- V. Extension of base line in triangulation survey
- VI. Error due to the trunnion axis not being perpendicular to the vertical axis in theodolite survey
- VII. Axis method of closing error adjustment of a theodolite traverse

2.

a) Discuss the significance 'Satellite station' in triangulation survey. 5

b) In a triangulation survey of a clockwise braced quadrilateral ADBC the observed angles are as follows:

Angle	° ' "	Angle	° ' "
BAD	58° 03' 40"	ABC	54° 56' 27"
CDA	22° 11' 00"	DCB	25° 33' 15"
CDB	19° 06' 50"	DCA	38° 06' 07"
ABD	80° 20' 52"	BAC	61° 18' 00"

Adjust the angles (with a precision of 1") by the method of equal shifts and tabulate the corrected angles.

Neglect the correction for spherical excess.

3.

a) Determine the distance and elevation formula for tangential method of tacheometry when both angles are in elevation.

6

b) In conducting a traverse ABCDEA, the length of the line CD and the bearing of the line EA could not be measured. Find the length of the line CD and the bearing of the line EA from remaining data given below.

Line	AB	BC	CD	DE	EA
Length (m)	178	228	Missing	126	238
Bearing	S 52° 30' E	N 48° 45' E	N 18° 15' W	S 78° 30' W	Missing

14

4.

a) What will be the amount of error in horizontal angle measurement if line of collimation is not perpendicular to the Trunnion axis? How the test and adjustment of vertical hair of cross hairs is done in a theodolite?

7

b) A tacheometer is set up at an intermediate point on a traverse course AB and the following observations are taken on a staff held vertically.

Staff stn.	W.C.B.	Vertical angle	Staff intercept (in m)	Axial hair reading (in m)	Remarks
A	40° 35'	- 04° 24'	2.172	1.962	R.L. of A
B	220° 35'	- 05° 12'	1.986	1.866	= 350.75 m

The tacheometer is fitted with an anallactic lens, and the multiplying constant is 100. Calculate the length of AB and the reduced level of B.

13

B.CIVIL ENGG. 2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION, 2017**(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~~

(40 marks for this part)

Use a separate Answer-Script for each part

No. of Question	Part-II	Marks
14	Answer Question-1 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 vertex and the apex of a simple curve is called ----- -----.</p> <p>b) The ratio between the centrifugal force and the weight of a vehicle is called ----- -----.</p> <p>c) The tangential angle of the long chord is called -----.</p> <p>d) A Pitot Tube is required for measurement of ----- of any waterbody.</p> <p>e) The maximum superelevation recommended under extra-ordinary condition for broad gauge railway track is ----- mm.</p> <p>f) In tunnel survey the very first step of field work comprises -----.</p> <p>g) In small-scale hydrographic survey primary horizontal control is usually established by virtue of -----.</p> <p>h) Rate of change in radial acceleration is expressed in ----- Unit.</p>	8*1=8
Q.1) B)	<p>State whether the under-mentioned statements are True or False with necessary justifications:</p> <p>a. At the junction point between a transition curve and a simple circular curve the superelevation provided is maximum.</p> <p>b. Two theodolite 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>	3*2=6

B.CIVIL ENGG. 2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION, 2017
(1st / 2nd Semester / Repeat / Supplementary / Annual / Biannual)

SUBJECT: SURVEYING-II

Full Marks: 100

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

(40 marks for this part)

Use a separate Answer-Script for each part

No. of Question	Part-II	Marks
Q.2)	a) Establish the fundamental expression for computing the ordinate from the long chord required for setting out of a simple circular curve. b) 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°34'. The radius of simple curve is fixed at 228.94m. Set out the simple curve by the method of "Tangential Angle" using a theodolite of 20" least count.	5 8
Q.3)	a) Discuss with the help of a neat sketch the "Shift" of a circular curve in the context of a transition curve? b) 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. i. Deflection Angle (Δ)= 65°32' ii. Maximum speed of the vehicle= 85 Kmph iii. Centrifugal Ratio= 0.25 iv. Chainage of the Vertex= 2534m v. Maximum rate of change in radial acceleration= 0.3m/sec ³ Calculate: i) Radius of the circular curve ii) Length of the transition curve iii) Shift of the circular curve iv) Total tangent length	5 2*4=8
Q.4)	a) Deduce the necessary expression for computing elevation of a vertical control point on the earth surface with respect to the known elevation of another control station by the method of "Direct Levelling". b) A vertical shaft was excavated and two plumb wires (A & B) were suspended into it at a distance of 3.798m. A theodolite was set up at C, within the tunnel, slightly off the line AB at a distance of 6.52m from the wire B. The angle ACB was found to be 2°20". Calculate the co-ordinates of the point C with respect to the line AB produced.	7 6