Ref No. – EX/CE/T/216/2018(S)

B.E. CIVIL ENGG. 2nd YEAR 1st SEM. SUPPLEMENTARY EXAMINATION 2018

SURVEYING - II

Time: Three hours

Full Marks 100
(60 marks for 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. Classification of triangulation survey

II. 'Shift correction' of a traverse in triangulation survey

III. The Subtense bar method in tacheometric survey

IV. Chromatic aberration in a theodolite telescope

V. Extension of base line in triangulation survey

VI. Test and adjustment: plate level axis is not perpendicular to vertical axis in theodolite

VII. Variation of "additive constant" in different types telescope of tacheometer

2.

b) Determine the distance and elevation formula for tangential method of tacheometry when both angles are in elevation. 6

a) On either side of a wood two stations A and B are fixed. The following traverse is run from A to B along the side of the wood.

Line	Length in m	Bearing
AC	436	48° 30'
CD	665	110° 20'
DB	580	152° 40'

From station D, a line DE is carried into the wood on a bearing of 168° 20', in order to fix an intermediate point E on AB. Determine the length of AB, EA and DE.

14

3.

a) What is a 'satellite station' in triangulation survey? Discuss about the four possible types of 'satellite station' in triangulation survey.

8

b) Compute the value of the correction to angle AOB for the phase error of cylindrical signals. The observed angle at A is $19^0\ 18'\ 53"$, at B is $56^0\ 38'\ 14"$ and at the sun is $76^0\ 28'\ 04"$ from an instrument station O, with respect to a reference line. The diameter of the cylindrical signals both at A and B is 400mm. Distances of station A and B from O are 16500m and 27500m respectively. The pointings are made on the bright line. Also determine the corrected value of angle AOB.

12

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?

8

b) The following notes refer to part of a traverse survey:

Line	Lengths in m	Bearing
PQ	190.0	$30^0\ 25'$
QR	649.6	$134^0\ 42'$
RS	428.8	$222^0\ 38'$

Compute the distance between a point A on PQ, and a point B on RS. Also compute the bearing of line AB. Distance PA and RB are measured by an anallactic tacheometer (K=100) with horizontal line of sight. The staff intercept for PA is 1.16m and same for RB is 2.87m.

12

Form A: Paper –Setting Blank

Ref No. – EX/CE/T/216/2018(S)

B.CIVIL ENGG. 2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION, 2018

(~~1st / 2nd Semester / Repeat~~ / Supplementary / ~~Annual / Biannual~~)

SUBJECT: SURVEYING-II

(Name in full)

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

Full Marks: 100

(40 marks for this part)

Use a separate Answer-Script for each part

No. of Question	Part-II	Marks
	Answer Question-1 and any *Two* questions from the rest	
Q.1) A)	**Fill in the blanks with appropriate word(s):** a) The angle subtended by a simple curve at its centre is called ----------. b) The ratio between the centrifugal force and the weight of a vehicle is called .... c) The angle between the rear tangent and the long chord is ..... d) A double float is required for measurement of ..... of any water body. e) The maximum superelevation recommended under extra-ordinary condition for broad gauge railway track is ..... mm. f) In tunnel survey "Weisbach Triangle Method" is adopted to eliminate the error due to	**6*1=6**
Q.1) B)	**State whether the under-mentioned statements are True or False with necessary justifications:** a) Reverse curve is not suited for meandering path of hilly areas. b) Direct line method is recommended for locating the sounding stations when they are scattered over the water body. c) Weisbach triangle method is followed for transference of levels in the tunnel.	**3*2=6**
Q.2)	a) Establish the fundamental expression for computing the deflection angle for **n^{th} peg** on a simple circular curve required for **"Double Theodolite Method"** of setting out of simple curve.	**6**

Form A: Paper –Setting Blank Ref No. – EX/CE/T/216/2018(S)

B.CIVIL ENGG. 2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION, 2018

(~~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)

No. of Question	Part-II	Marks
Q.2)	b) Calculate the reduced levels (RLs) of various station pegs on a vertical curve connecting two uniform grades of **(0.73%)** and **(-0.55%)**. The chainage and the reduced level at the point of intersection are **446m** and **313.57m** respectively. Consider the rate of change of grade as **0.1%** per **30m.**	8
Q.3)	a) Establish with the help of pertinent expressions "Shift bisects the transition curve and vice-versa".	6
	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)= 63°42′** ii. **Maximum speed of the vehicle= 84 Kmph** iii. **Centrifugal Ratio= 0.25** iv. **Chainage of the Vertex= 2569m** v. **Maximum rate of change in radial acceleration= 0.3m/sec³** **Calculate:** i) Radius of the circular curve ii) Length of the transition curve iii) Shift of the circular curve iv) Total tangent length	2*4=8
Q.4)	a) Describe the **"Simm's Method"** of transferring the surface centerline underground with the help of pertinent sketch.	6
	b) 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 **227m** and **239m** respectively and the angle ∟**ABC** was **122°36′**. The observed angles ∟**AOB** and ∟**BOC** were **38°45′** and **39°25′** respectively. What are the distances of **(O)** from **A, B** and **C**?	8