Ref No. – **EX/CE/5/T/202/2017(OLD)(S)**

B.CIVIL ENGG. (EVENING) 2nd YEAR 1st SEM. SUPPLEMENTARY EXAM. 2017 (OLD)

SURVEYING – II (OLD)

Full Marks 100

Time: Three hours (50 marks for each 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 four): (4×5) = 20

   I. Relations between the fundamental axes to be a proper condition theodolite

   II. Diaphragm of a theodolite telescope

   III. Closing error adjustment of a traverse

   IV. Least count of a theodolite

   V. Gale's traverse table

   VI. Measurement of horizontal angle by theodolite

   VII. Fixed hair method of tacheometric survey

2. Following are the lengths and bearings of the sides of a traverse ABCDE. The lengths of BC and CD are missing. Compute the lengths of BC and CD.

Line	Length in m	Bearing
AB	217.5	S 59° 45' E
BC	?	N 62° 30' E
CD	?	N 37° 36' W
DE	283.5	S 55° 18' W
EA	173.15	S 02° 40' W

15

3.

Find the Hoz. length and gradient from A to B using the data given in the table.

Instrument at	Staff at	line	Bearing	Vertical angle	Cross hair readings
P	A	PA	85^0	$-3^0\,30'$	1.35, 2.10, 2.85
P	B	PB	143^0	$2^0\,45'$	1.955, 2.860, 3.765

The staff was held vertical in both cases. The constants of the instruments K=100, C=0.1.

15

4.

The bearings of PQ and QR are 18° 36' and 60° 24', respectively. The coordinates of P and R are as follows (in meters).

Point	Northing	Easting
P	300.0	400.0
R	1432.8	1257.2

Compute the length PQ and QR.

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Form A: Paper –Setting Blank

Ref No. – EX/CE/5/T/202/2017(OLD)(S)

B.CIVIL ENGG. (EVENING) 2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION, 2017

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

SUBJECT: SURVEYING-II (OLD)

(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

No. of Question	Part-II	Marks
	Answer Question-1 and 2 and any *Two* questions from the rest	
Q.1) A)	**Fill in the blanks with appropriate word(s):** a) The distance between the mid-point of the long chord and the apex of a simple curve is called ----------. b) A vertical curve of .....configuration is not usually considered for complicacy of calculation. c) The angle between the original tangent and the tangent common to both transition and circular curve is called ..... d) The sounding stations are located by ..... for deep seas. e) The maximum superelevation recommended under normal condition for narrow gauge railway track is ..... mm. f) In tunnel survey short vertical depths are measured by	**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.	**7**

Form A: Paper –Setting Blank

Ref No. – EX/CE/5/T/202/2017(OLD)(S)

B.CIVIL ENGG. (EVENING) 2nd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION, 2017

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

SUBJECT: SURVEYING-II (OLD)

(Name in full)

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

Full Marks: 100
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Question	Part-II	Marks
	b) Deduce the necessary expression for **rear tangent length** (T_r) of a reverse curve comprising two simple circular arc bending in opposite direction?	7
	c) What are the conditions to be satisfied by a transition curve when inserted at both ends of a circular curve?	4
Q.3)	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**.	10
Q.4)	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**?	10
Q.5)	a) Describe the **"Simm's Method"** of transferring the surface centerline underground with the help of pertinent sketch.	5
	b) A vertical shaft was excavated and two plumb wires **(A & B)** were suspended into it at a distance of **3.693m**. A theodolite was set up at **C**, within the tunnel, slightly off the line **AB** at a distance of **6.79m** from the wire **B**. The angle **ACB** was found to be **2′40″**. Calculate the co-ordinates of the point **C** with respect to the line **AB** produced.	5