

**B.E. CIVIL ENGINEERING (PART TIME) 1<sup>st</sup> YEAR 2<sup>nd</sup> SEMESTER EXAMINATION, 2017**  
**(1<sup>st</sup> / 2<sup>nd</sup> Semester / Repeat / Supplementary / Annual / Biannual)**

**SUBJECT: SURVEYING-II**

**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
	<p><b>Answer Question-1 and 2 and any <i>Two</i> questions from the rest</b></p>	
Q.1) A)	<p><b>Fill in the blanks with appropriate word(s):</b></p> <p>i. The distance between apex and vertex of a simple curve is called .....</p> <p>ii. The sounding stations are located by ..... for deep seas.</p> <p>iii. .... is the form of an ideal transition curve.</p> <p>iv. Tracer method is adopted for measurement of ..... of any water body.</p> <p>v. The angle between the original tangent and the tangent common to both transition and circular curve is called .....</p> <p>vi. In tunnel survey the very first step of field work comprises .....</p>	1*6=6
B)	<p><b>State whether the under-mentioned statements are True or False with necessary justifications:</b></p> <p>a) Reverse curve is not suited for meandering path of hilly areas.</p> <p>b) <b>Two theodolite method</b> is recommended for locating the sounding stations when they are scattered over the water body.</p> <p>c) <b>Weisbach triangle method</b> 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 <math>n^{\text{th}}</math> peg on a simple circular curve required for "<b>Double Theodolite Method</b>" of setting out of simple curve.</p>	6

**B.E. CIVIL ENGINEERING (PART TIME) 1<sup>st</sup> YEAR 2<sup>nd</sup> SEMESTER EXAMINATION, 201**  
**(1<sup>st</sup> / 2<sup>nd</sup> Semester / Repeat / Supplementary / Annual / Biannual)**  
**SUBJECT: SURVEYING-II**

Full Marks: 10

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-I	Marks
	b) Deduce the necessary expression for calculating <b>shift</b> of a circular curve. c) Describe the " <b>Simm's Method</b> " of transferring the surface centerline of a tunnel underground.	6 6
Q.3)	Calculate the reduced levels (RLs) of various station pegs on a vertical curve connecting two uniform grades of <b>(0.73%)</b> and <b>(-0.55%)</b> . The chainage and the reduced level at the point of intersection are <b>446m</b> and <b>313.57m</b> respectively. Consider the rate of change of grade as <b>0.1% per 30m</b> .	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 <b>236m</b> and <b>249m</b> respectively and the angle $\angle ABC$ was <b>127°58'</b> . The observed angles $\angle AOB$ and $\angle BOC$ were <b>32°22'</b> and <b>41°39'</b> respectively. What are the distances of (O) from A, B and C?	10
Q.5)	a) Deduce the necessary expression for computing difference in elevation between two points on the earth surface by the method of " <b>Reciprocal Levelling</b> ". b) A vertical shaft was excavated and two plumb wires (A & B) were suspended into it at a distance of <b>3.738m</b> . A theodolite was set up at C, within the tunnel, slightly off the line AB at a distance of <b>6.675m</b> from the wire B. The angle ACB was found to be <b>4'20"</b> . Calculate the co-ordinates of the point C with respect to the line AB produced.	5 5

Time: Three hours

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)*

Q.1. Write short notes on the following (any four):

(4×4) = 16

- I. 'Phase error' of cylindrical signals in triangulation survey
- II. The Subtense bar method in tacheometric survey
- III. Spire test in theodolite – necessity and principle
- IV. Extension of base line in triangulation survey
- V. The test and adjustment of vertical hair of cross hairs in a theodolite
- VI. Axis method of closing error adjustment of a theodolite traverse

Q.2.

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

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- b) Following are the lengths and bearings of the sides of a closed traverse BCDEAB. The bearing of BC and the length of CD are missing. Compute the bearing of BC and length of CD.

Line	BC	CD	DE	EA	AB
Length (m)	320.0	Missing	284	173	218
Bearing	Missing	N 37° 40' W	S 55° 20' W	S 03° 20' W	S 59° 40' E

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Q.3.

- a) What are the necessary and sufficient conditions for a braced quadrilateral in triangulation survey?

Prove the conditions.

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- b) Directions were observed from a satellite station S, 62.5m from triangulation station C. The following observations were recorded

Station	Observed Direction	Distance from C (in m)
A	00° 00'	16485
B	71° 54' 30"	21733
C	296° 12'	--

Compute the angle subtended at the centre C ( $\angle ACB$ ).

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Q.4.

- a) Discuss the significance and permissible errors in 'primary', 'secondary' and 'tertiary' triangulations. 6
- b) The following data refer to a traverse ABCDA run by a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff held vertically.

Line	Bearing	Vertical Angle	Staff Intercept (m)
AB	30° 27'	+ 5° 10'	1.875
BC	300° 38'	+ 3° 20'	1.446
CD	226° 54'	- 2° 40'	1.725

Find the length and bearing of DA.

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