

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

SURVEYING - II

Time: Three hours

Full Marks 100
(60 marks part I)

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): (4×5) = 20
- I. Discuss the criteria for selecting triangulation station
 - II. Relations between the fundamental axes to be a proper condition theodolite
 - III. Prove 'D = k.S + C' (with usual notations) in fixed hair stadia method of tacheometry
 - IV. 'Spherical excess' and its significance in triangulation survey
 - V. Method of 'equal shift' for adjustment of traverse in triangulation survey
 - VI. Test and adjustment: plate level axis is not perpendicular to vertical axis in theodolite
 - VII. Difference between 'Spherical Aberration' and 'Chromatic Aberration'
- 2.
- a) Determine the distance and elevation formula in tangential method of tacheometry, when one angle is at elevation and other angle is at depression with staff held vertical (Show deduction with diagram). 8
 - b) Compute the value of the correction to angle AOB for the phase error of cylindrical signals. The observed angle at A is $19^{\circ} 18' 53''$, at B is $56^{\circ} 38' 14''$ and at the sun is $76^{\circ} 28' 04''$ from an instrument station O, with respect to a reference line. The diameter of the cylindrical signals both at A and B is 200mm. 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.

3.

a) What is a 'satellite station' in triangulation survey? How actual angle is calculated at the station, where it cannot be occupied with instrument, with the help of 'satellite station'? Discuss about the four possible types of 'satellite station' in triangulation survey.

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b) The following is the data related to observations made on a vertically held staff with a tachometer 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° 20'	00° 00'	1.88, 2.25, 2.62	R.L. of O = 140 m
		B	60° 40'	+ 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.

a) What is the correction to any side for the 'Axis method' of closing error adjustment of a traverse? Why 'Axis method' is favoured for the adjustment of closing error in theodolite traverse?

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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)	178.6	228.4	Missing	126.7	238.8
Bearing	S 52° 30' E	N 48° 45' E	N 18° 15' W	S 78° 30' W	Missing

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B.E (Civil Engg.) 2nd YEAR 1st SEMESTER 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

Question No.	Part-II	Marks
	<p style="text-align: center;">Answer Question-1 and 2 and any <i>Two</i> questions from the rest</p> <p>Q.1) A) Fill in the blanks with appropriate word(s):</p> <ul style="list-style-type: none"> i. The tangential angle of the long chord is called ii. The ratio between the centrifugal force and the weight of a vehicle is called iii. Rod float is required for measurement of of any water body. iv. The maximum superelevation recommended under normal condition for broad gauge railway track is mm. v. Rate of change in radial acceleration is expressed in Unit. <p>Q.2)</p> <ul style="list-style-type: none"> a) Deduce the necessary expression for forward tangent length (T_r) of a compound curve comprising two simple circular arcs bending in same direction. 6 b) Describe the “Weisbach Triangle Method” of transferring the surface centerline underground with the help of pertinent sketch. 5 d) 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”. 5 	<p style="text-align: center;">1*5=5</p>

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B.E (Civil Engg.) 2nd YEAR 1st SEMESTER 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)

No. of Question	Part-II	Marks
Q.3)	Calculate the reduced levels (RLs) of various station pegs on a vertical curve connecting two uniform grades of (0.74%) and (-0.57%). The chainage and the reduced level at the point of intersection are 436m and 303.52m respectively. Consider the rate of change of grade as 0.1% per 30m.	10
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> <p>i. Deflection Angle (Δ)= $62^{\circ}49'$</p> <p>ii. Maximum speed of the vehicle= 86 Kmph</p> <p>iii. Centrifugal Ratio= 0.25</p> <p>iv. Maximum rate of change in radial acceleration= 0.3m/sec^3</p> <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+2+4=10
Q.5)	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 225m and 265m respectively and the angle $\angle ABC$ was $125^{\circ}38'$. The observed angles $\angle AOB$ and $\angle BOC$ were $36^{\circ}42'$ and $40^{\circ}17'$ respectively. What are the distances of (O) from A, B and C?	10