

B.E. CIVIL ENGINEERING (1st YEAR, 2nd SEMESTER) EXAMINATION, 2018
(1st / 2nd Semester / ~~Repeat~~ / ~~Supplementary~~ / ~~Annual~~ / ~~Biannual~~)

SUBJECT: SURVEYING-I

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-I	Marks
Answer Question-1 and any two from the rest		
<p>Q.1) A.</p> <p>a)</p> <p>b)</p> <p>c)</p> <p>d)</p> <p>e)</p> <p>f)</p> <p>g)</p> <p>h)</p>	<p>Fill in the blanks with appropriate word(s):</p> <p>A representation is called a map when the scale is</p> <p>An arrow has a standard length ofcm.</p> <p>Slope correction is always</p> <p>Cross staff and optical square are used for setting out</p> <p>The bearing observed with a prismatic compass is called bearing.</p> <p>The coordinates of any point with reference to a common origin are called</p> <p>The line passing through the points of zero declination is called</p> <p>A perpendicular can be dropped to a chain line from a point outside it by method.</p>	<p align="center">8*1=8</p>
<p>Q.1) B.</p> <p>a)</p> <p>b)</p> <p>c)</p>	<p>State whether the under-mentioned statements are True or False with necessary justifications:</p> <p>a) Surveying should be always carried out from part to whole</p> <p>b) Well-conditioned triangles are preferred for developing the framework of chain surveying</p> <p>c) Reduced bearing always exceeds 90°</p>	<p align="center">3*2=6</p>
<p>Q.2) a)</p> <p>b)</p> <p>c)</p>	<p>State the essential features of Plane Surveying.</p> <p>Discuss with the help of pertinent expressions on the 'Mean Sea Level Correction' in connection with distance measurement.</p> <p>A steel tape was exactly 30m long at 20°C when supported throughout its length under a pull of 14Kg. A line was measured with a pull of 11Kg applied to the tape at a mean temperature of 17°C and found to be 848m long. Given, the cross sectional area of the tape=0.034cm²; total weight of the tape=0.656Kg; α for steel=11*10⁻⁶/°C; E for steel= 2.1*10⁶ Kg/cm². Mean elevation of the line above mean sea level is 647m. Radius of Earth is 6371 km. Compute the true length of the line if the tape was supported during measurement at every 15m.</p>	<p align="center">3</p> <p align="center">3</p> <p align="center">7</p>

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No. of Question	Part-I	Mark
Q.3) a)	Discuss with the help of a neat sketches the methods followed in overcoming the obstacle in chain surveying when both chaining and vision are obstructed.	5
b)	Deduce the necessary expression for calculating the limiting length of the offset when the error is in both length and direction.	4
c)	Write short notes on i) Check Line ii) Tie line offsets	2+2
Q.4) a)	What do you mean by "Closing Error"? How do you eliminate the closing error of a traverse graphically?	2+5
b)	The following were the interior angles of a closed traverse ABCD: A= 78°36', B= 101°24', C= 96°45', and D= 83°15'	6
	If the fore bearing of the line BC is 131°15', find the bearings of all the remaining sides, assuming the work done in a clock-wise direction.	

Ex/CE/T/125/2018

B.E. CIVIL ENGINEERING EXAMINATION, 2018
 (2nd Year, 1st Semester)
SURVEYING-I
(PART-II)

Time: Three Hours

Full Marks 100
(60 marks for this part)

No. of questions	(Answer any three of the following questions.)	Marks (3X20=60)													
1	<p>(a) Define the following terms with the help of neat sketches in connection with 'Levelling': (i) Level surface (ii) A vertical plane (iii) Change point (iv) Intermediate sight</p> <p>(b) (i) Explain the sensitivity of bubble tube. Derive an expression to determine the sensitivity of bubble tube. (ii) On a level, angular value of one division of the bubble tube is 30". Find the radius of curvature of tube.</p> <p>(c) The following readings refer to an operation involving reciprocal leveling:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Instrument at</th> <th colspan="2">Staff reading (m) on</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>1.405</td> <td>2.775</td> <td rowspan="2">RL of B = 200.00 m Distance AB = 1150 m</td> </tr> <tr> <td>B</td> <td>0.650</td> <td>1.795</td> </tr> </tbody> </table> <p>Provide a neat sketch specific to the problem when the instrument is near A. Also Find: (i) True RL of A (ii) Combined correction for curvature and refraction. (iii) The error in collimation adjustment of the instrument.</p>	Instrument at	Staff reading (m) on		Remarks	A	B	A	1.405	2.775	RL of B = 200.00 m Distance AB = 1150 m	B	0.650	1.795	<p>[4]</p> <p>[2+4]</p> <p>[2]</p> <p>[8]</p>
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	A	B													
A	1.405	2.775	RL of B = 200.00 m Distance AB = 1150 m												
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2	<p>(a) Write short notes on: (i) Check levelling (ii) Differential levelling</p> <p>(b) The following staff readings were taken with a level: 1.185, 2.604, 1.925, 2.305, 1.155, 0.864, 1.105, 1.685, 1.215, 1.545 and 0.605. The first reading was taken on a Bench Mark (B.M.) of R.L. 185.685. The instrument was shifted after the readings 2.604, 0.864 and 1.215. Work out the RLs. of all stations using Rise and fall method and apply the arithmetical check.</p> <p>(c) Differentiate between rise and fall method and height of instrument method.</p> <p>(d) Show with neat sketches the characteristic feature of contour lines for the following: (i) Overhanging Clip (ii) Ridge</p>	<p>[4+4]</p> <p>[7]</p> <p>[3]</p> <p>[2]</p>													

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No. of questions	(Answer any three of the following questions.)	Marks (3X20=60)																				
3 (a)	Compare between the Direct and Indirect methods of contouring.	[3]																				
(b)	What are the various methods of plane tabling? Describe the 'method of intersection' with a neat sketch.	[1+5]																				
(c)	What is resection? Explain the 'tracing paper method' of three point problem with a neat sketch.	[2+5]																				
(d)	State the advantages and disadvantages of plane table survey over other types of survey	[4]																				
4 (a)	The lengths and bearings of a four-sided traverse are as follows. The lengths are AB = 320m, BC = 440m, CD = 390m, DA = 513.8m. The reduced bearings of the lines are AB = N45°15'E, BC = S71°30'E, CD = S30°15'W and DA = N60°44'W. Find the area of the traverse from coordinates of the vertices.	[7]																				
(b)	Derive the parabolic or Simpson's rule. On what assumption it is derived?	[3+1]																				
(c)	The offsets are taken from a chain line are given below. Find the area between the first and last offsets, the boundary, and the chain line using (a) the average ordinate rule, (b) the trapezoidal rule and (c) Simpson's rule	[6]																				
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">Chainage (m)</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">20</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;">40</td> <td style="padding: 2px;">50</td> <td style="padding: 2px;">60</td> <td style="padding: 2px;">70</td> <td style="padding: 2px;">80</td> </tr> <tr> <td style="padding: 2px;">Offset (m)</td> <td style="padding: 2px;">4.25</td> <td style="padding: 2px;">5.38</td> <td style="padding: 2px;">6.94</td> <td style="padding: 2px;">6.84</td> <td style="padding: 2px;">6.25</td> <td style="padding: 2px;">6.34</td> <td style="padding: 2px;">6.14</td> <td style="padding: 2px;">7.23</td> <td style="padding: 2px;">5.9</td> </tr> </table>			Chainage (m)	0	10	20	30	40	50	60	70	80	Offset (m)	4.25	5.38	6.94	6.84	6.25	6.34	6.14	7.23	5.9
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Offset (m)	4.25	5.38	6.94	6.84	6.25	6.34	6.14	7.23	5.9													
(d)	Will the area of a traverse calculated by different methods give identical results? Explain.	[3]																				