

B.E. CIVIL ENGINEERING (1st YEAR, 2nd SEMESTER) EXAMINATION, 2017
(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
<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 align="center">Answer Question-1 and any two from the rest</p> <p>Fill in the blanks with appropriate word(s):</p> <p>A representation is called a plan when the scale is</p> <p>Geodetic Surveying is usually carried out over an area exceeding sq. km.</p> <p>Invar tape is made of an alloy of steel (64%) and</p> <p>..... is the average distance of the fluctuating surface from the centre of the earth.</p> <p>A perpendicular can be erected to a chain line at a point on it by method.</p> <p>True bearing of a line is also called</p> <p>Quadrantal bearings are observed by</p> <p>The coordinates of any point with reference to the preceding point are called</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) Sag correction is always positive</p> <p>b) Well-conditioned triangles are not preferred for developing the framework of chain surveying</p> <p>c) Whole circle bearing never exceeds 180°</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 Geodetic Surveying.</p> <p>Discuss with the help of pertinent expression on the 'Slope Correction' in connection with distance measurement.</p> <p>A plan was plotted to a scale of 1:2500. The paper has shrunk over a period of time so that the line originally 15cm long now measures only 14.83cm. It is also mentioned that the data used in plotting was measured with a 30m chain 13 cm too long. If the area of the plotted plan now measures 97.62sq. cm, find the true area of the land represented by the plot.</p>	<p align="center">3</p> <p align="center">3</p> <p align="center">7</p>

B.E. CIVIL ENGINEERING (1st YEAR, 2nd SEMESTER) EXAMINATION, 2017
(1st / 2nd Semester / -Repeat- / Supplementary / Annual / -Biannual)

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

Full Marks 100
(40 marks for this part)

No. of Question	Part-I	Marks
Q.3) a)	Discuss with the help of a neat sketch the following terms in the context of Chain Surveying: i) Base Line ii) Tie station iii) Check Line	2+2+2
b)	Discuss with the help of a neat sketches the methods followed to measure horizontal distance across a river.	5
c)	Examine whether a triangle having sides 151m, 112m and 253m is well-conditioned or not.	2
Q.4) a)	State the essential features of “Quadrantal System” of designating bearings.	3
b)	What do you mean by “Relative Error of Closure” of a closed traverse? How do you detect the presence of local attraction in the field?	2+2
c)	Determine the values of included angles in a closed traverse ABCDEA. Given the back bearings of different sides: AB=287°15', BC=202°00', CD=101°30', DE=9°15' and EA=304°45'. Exercise the necessary check.	6

B.E. CIVIL ENGINEERING EXAMINATION, 2017(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 (a)	Define the following terms with the help of neat sketches in connection with 'Levelling': (i) Reduced Level (ii) Datum surface (iii) Change point (iv) Back sight and Fore sight	[4]														
(b)	(i) Explain the sensitivity of bubble tube. Derive an expression to determine the sensitivity of bubble tube. (ii) A bubble tube has a sensitivity of 23" for 2 mm division. Find the error in staff reading at a distance of 80 meters caused by the bubble out by one division.	[2+4] [2]														
(c)	The following readings refer to an operation involving reciprocal leveling: <table border="1" data-bbox="272 965 1235 1122"> <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>1.155</td> <td>2.595</td> <td>RL of A = 525.5m</td> </tr> <tr> <td>B</td> <td>0.985</td> <td>2.415</td> <td>Distance AB = 500m</td> </tr> </tbody> </table> Provide a neat sketch specific to the problem when the instrument is near A. Also Find: (a) True RL of B (b) Combined correction for curvature and refraction. (c) The error in collimation adjustment of the instrument.	Instrument at	Staff reading (m) on		Remarks	A	B	A	1.155	2.595	RL of A = 525.5m	B	0.985	2.415	Distance AB = 500m	[8]
Instrument at	Staff reading (m) on		Remarks													
	A	B														
A	1.155	2.595	RL of A = 525.5m													
B	0.985	2.415	Distance AB = 500m													
2 (a)	What do you understand by 'Equalizing back sight and fore sight'?	[2]														
(b)	Write short notes on: (i) Cross-sectional levelling (ii) Fly levelling	[3x2 = 6]														
(c)	The following staff readings were taken with a level: 0.355, 0.485, 0.625, 1.755, 1.895, 2.350, 1.780, 0.345, 0.685, 1.230 and 2.150. The first reading was taken on a Bench Mark (B.M.) of R.L. 255.50. The instrument was shifted after fourth and seventh readings. Work out the RLs. of all stations using height of instrument method.	[6]														
(d)	Show with neat sketches the characteristic feature of contour lines for the following: (i) Hill (ii) Ridge (iii) Valley	[3]														

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No. of questions	(Answer any three of the following questions.)	Marks (3X20=60)																				
(e)	Write a short note on 'Contour gradient'.	[3]																				
3 (a)	Define the term 'Horizontal equivalent' of contour. (b) Compare between the Direct and Indirect methods of contouring (c) Derive expressions for Trapezoidal and Simpson's rule for finding out areas along curved boundaries. (d) The following perpendicular offsets were taken from a chain line to an irregular boundary: <table border="1" data-bbox="321 949 1284 1032"> <tr> <td>Distance</td> <td>0</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> <td>80</td> </tr> <tr> <td>Offset</td> <td>3.6</td> <td>5.3</td> <td>6.3</td> <td>6.2</td> <td>5.4</td> <td>6.8</td> <td>7.4</td> <td>6.4</td> <td>5.8</td> </tr> </table> Calculate the area enclosed between the chain line and the offsets by (i) Trapezoidal rule (ii) Simpson's rule	Distance	0	10	20	30	40	50	60	70	80	Offset	3.6	5.3	6.3	6.2	5.4	6.8	7.4	6.4	5.8	[2] [4] [6] [8]
Distance	0	10	20	30	40	50	60	70	80													
Offset	3.6	5.3	6.3	6.2	5.4	6.8	7.4	6.4	5.8													
4 (a)	Derive the expression for the area of a two-level section (b) A two-level section has the following data. Formation Width = 10m Side slopes = 1.5:1 Transverse slope = 6:1 Depth of cutting at 20m intervals at five sections: 2m, 2.25m, 2.85m, 3.2m and 3.55m. Find the volume by the prismoidal formula and trapezoidal formula. (c) What is the principle of Plane Table survey? Write a short note on the 'Orientation of Plane Table'. (d) What is a two-point problem? Explain with a neat sketch the procedure of solving it.	[5] [6] [1+2] [2+4]																				