

B. ARCHITECTURE 2nd YEAR 1st SEMESTER EXAMINATION- 2018
(2nd Year, 1st Semester)
SURVEYING

Time: Three Hours

Full Marks 100

No. of questions	(Answer any four of the following questions.)	Marks (4 X 25=100)
1 (i)	Define Surveying. Explain basic principles of surveying.	[2+4]
(ii)	Write a short note on the sources of errors in surveying? Explain 'Precision' and 'Accuracy'.	[3+6]
(iii)	What is Representative Fraction (RF)? Differentiate between Engineer's scale and Graphical scale.	[1+3]
(iv)	Define Ranging. Explain Indirect ranging with a neat sketch.	[2+4]
2 (i)	Define offset in connection with chain surveying. Explain with sketches how the numbers of offsets are decided.	[2 +3]
(ii)	An offset was laid out 5° from its true direction and the scale of the map was 20m to 1cm. Find the maximum length of offset for the displacement of a point on the paper not to exceed 0.03cm.	[4]
(iii)	A 20m steel tape was standardized on flat ground, at a temperature of 20°C and under a pull of 15kg. The tape was used in a catenary at a temperature of 30°C and under a pull of P kg. The cross-sectional area of the tape is 0.22cm ² , and its total weight is 400 g. The Young's modulus and coefficient of linear expansion of steel are 2.1×10 ⁶ kg/cm ² and 11×10 ⁻⁶ per °C respectively. Find the correct horizontal distance if P is equal to 10kg.	[8]
(iv)	Define Base line, Check line, and Tie lines in chain surveying.	[3]
(v)	Describe a method to overcome obstacle when chaining is obstructed but vision is free in the case if you cannot go around the obstruction.	[5]
3 (i)	Define the following terms: (a) Reduced Bearing, (b) Magnetic Meridian, (c) Magnetic Declination and (d) Fore Bearing	[4]
(ii)	Convert the following whole circle bearings to reduced bearings (a) 70°30', (b) 120°45', (c) 223°30' and (d) 320°47'	[6]
(iii)	Discuss about the correction for 'Internal angles' and correction for 'Closing error' while to plot a compass traverse.	[3+3]
(iv)	A traverse ABCDA is made in the form of a square taking in clockwise order. If the bearing of AB is 120°30', find the bearing of the other sides.	[6]
(v)	Write a short not on Local attraction.	[3]

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4 (i)	<p>The following bearings were recorded while traversing with a compass and the area was suspected with local attraction.</p> <table border="1" data-bbox="329 533 743 689"> <thead> <tr> <th>Line</th> <th>FB</th> <th>BB</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td>66°20'</td> <td>246°20'</td> </tr> <tr> <td>BC</td> <td>139°30'</td> <td>318°50'</td> </tr> <tr> <td>CD</td> <td>189°40'</td> <td>11°20'</td> </tr> <tr> <td>DA</td> <td>300°30'</td> <td>119°30'</td> </tr> </tbody> </table> <p>Find the correct bearings of the lines.</p>	Line	FB	BB	AB	66°20'	246°20'	BC	139°30'	318°50'	CD	189°40'	11°20'	DA	300°30'	119°30'	[8]
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(ii)	Define the following terms in connection with levelling:	[3]															
(iii)	(a) Fore sight reading (b) Datum surface, and (c) Reduced Level	[3]															
(iii)	(a) What is Reciprocal levelling?	[3]															
(iii)	(b) The following readings refer to an operation involving reciprocal leveling:	[3]															
	<table border="1" data-bbox="329 931 1292 1070"> <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> <p>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.</p>	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+6]	
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	A	B															
A	1.155	2.595	RL of A = 525.5m														
B	0.985	2.415	Distance AB = 500m														
(iv)	Write short notes on:	[3+3]															
(iv)	(a) Cross-sectional levelling (b) Differential levelling	[3+3]															
5 (i)	The following staff readings were taken with a level:	[8]															
	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.																
(ii)	Explain the following operations in plane tabling:	[2+2+2]															
(ii)	(a) Levelling, (b) Orientation and (c) Centering	[2+2+2]															
(iii)	Explain the 'method of radiation' to locate the details in plane table surveying with a proper sketch.	[8]															
(iv)	State the advantages of plane table survey over other types of survey.	[3]															