

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, NOVEMBER - 2023**

**ADVANCED SURVEYING**

[Maximum Marks : 75]

[Time : 3 hours]

**PART-A**

**I. Answer all the following questions in one word or sentence. Each question carries 1 mark.**

**(9x1=9 marks)**

		Module Outcome	Cognitive level
1	Contour lines of different elevations can unite to form one line only in case of a.....	M1.01	U
2	Define trunnion axis of theodolite.	M1.02	R
3	Outline the formulae for closing error in theodolite surveying.	M2.01	U
4	What are the two constants of tachometer?	M2.03	R
5	Show the relation between degree and radius of the curve.	M2.04	R
6	How does a digital theodolite differ from non-digital theodolite?	M3.01	R
7	The total station sends out invisible infrared waves that are reflected by.....	M3.02	R
8	Expand the term GIS.	M4.03	R
9	.....is the type of photogrammetry in which camera is mounted in an aircraft and is pointed vertically towards the ground.	M4.04	R

**PART B**

**II. Answer any Eight questions from the following. Each question carries 3 marks.**

**(8x3=24 marks)**

		Module Outcome	Cognitive level																								
1	Give any two formulae to determine the capacity of reservoirs using contour maps.	M1.01	R																								
2	Define the terms Plunging, Swinging and Changing face.	M1.02	R																								
3	Illustrate any three relationships between Fundamental lines for a theodolite.	M1.03	U																								
4	Explain the latitude and departure of a line.	M2.02	U																								
5	Define the types of traverses.	M2.01	R																								
6	Execute the latitudes for the given survey lines. <table border="1" style="margin: 5px auto; border-collapse: collapse;"> <thead> <tr> <th>Line</th> <th>Length</th> <th>Reduced bearing</th> <th>Stations</th> </tr> </thead> <tbody> <tr> <td>PQ</td> <td>110.80</td> <td>S72°50' 10"E</td> <td>P</td> </tr> <tr> <td>QR</td> <td>100.80</td> <td>N34°54' 50"E</td> <td>Q</td> </tr> <tr> <td>RS</td> <td>99.80</td> <td>S45°55' 20"W</td> <td>R</td> </tr> <tr> <td>ST</td> <td>95.80</td> <td>S63°30' 10"W</td> <td>S</td> </tr> <tr> <td>TP</td> <td>101.80</td> <td>S1°10' 10"E</td> <td>T</td> </tr> </tbody> </table>	Line	Length	Reduced bearing	Stations	PQ	110.80	S72°50' 10"E	P	QR	100.80	N34°54' 50"E	Q	RS	99.80	S45°55' 20"W	R	ST	95.80	S63°30' 10"W	S	TP	101.80	S1°10' 10"E	T	M2.02	A
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7	List any 6 components of Total station.	M3.02	R																								
8	Summarize the steps for traversing using total station.	M3.03	U																								
9	How do receivers work in GPS?	M4.02	R																								
10	Define Geographical Information System.	M4.03	R																								

## PART C

Answer **all** questions from the following. Each question carries 7 marks.

**(6x7=42marks)**

		Module Outcome	Cognitive level																				
III	Express the contour sketch for a hill and valley/depression with representative contour values. <b>OR</b>	M1.01	U																				
IV	Summarize the objectives of four permanent adjustment of a theodolite.	M1.04	U																				
V	The area within the contour lines of the side of reservoir and the face of the proposed dam is given below. Execute the capacity of reservoir using Simpson's rule and Trapezoidal rule. <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Contour</td> <td style="padding: 2px;">90</td> <td style="padding: 2px;">95</td> <td style="padding: 2px;">100</td> <td style="padding: 2px;">105</td> <td style="padding: 2px;">110</td> <td style="padding: 2px;">115</td> <td style="padding: 2px;">120</td> <td style="padding: 2px;">125</td> <td style="padding: 2px;">130</td> </tr> <tr> <td style="padding: 2px;">Area</td> <td style="padding: 2px;">820</td> <td style="padding: 2px;">978</td> <td style="padding: 2px;">1224</td> <td style="padding: 2px;">1504</td> <td style="padding: 2px;">1696</td> <td style="padding: 2px;">1710</td> <td style="padding: 2px;">1920</td> <td style="padding: 2px;">2005</td> <td style="padding: 2px;">2287</td> </tr> </table>	Contour	90	95	100	105	110	115	120	125	130	Area	820	978	1224	1504	1696	1710	1920	2005	2287	M1.01	A
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VI	OR Explain the terms in theodolite survey. (i) Transit and non-transit (ii) Vernier and micrometer.	M1.02	U																				
VII	The following table give the corrected latitudes and departure (in m) of the sides of a closed traverse ABCD. Execute the area of the traverse from consecutive coordinates. Let the independent coordinates at station A be (200,200). <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Side</th> <th style="padding: 2px;">Latitude</th> <th style="padding: 2px;">Departure</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">AB</td> <td style="padding: 2px;">-116.1</td> <td style="padding: 2px;">-44.4</td> </tr> <tr> <td style="padding: 2px;">BC</td> <td style="padding: 2px;">6.8</td> <td style="padding: 2px;">58.2</td> </tr> <tr> <td style="padding: 2px;">CD</td> <td style="padding: 2px;">80.5</td> <td style="padding: 2px;">17.2</td> </tr> <tr> <td style="padding: 2px;">DA</td> <td style="padding: 2px;">28.8</td> <td style="padding: 2px;">-31.0</td> </tr> </tbody> </table>	Side	Latitude	Departure	AB	-116.1	-44.4	BC	6.8	58.2	CD	80.5	17.2	DA	28.8	-31.0	M2.02	A					
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VIII	OR Explain briefly the two systems of Tacheometry.	M2.03	U																				
IX	Solve for the ordinates at 10 meter distance for a circular curve having a long chord of 80 meter and a versed sine of 4 meter. <b>OR</b>	M2.04	A																				
X	Explain the method of theodolite traversing by included angle and deflection angles.	M2.01	U																				
XI	Explain the parts of a digital theodolite. <b>OR</b>	M3.01	U																				
XII	Explain any three error sources in Total station surveying.	M3.04	U																				
XIII	Explain any three applications of GPS in civil engineering. <b>OR</b>	M4.02	U																				
XIV	Explain Map projection and Classify the following methods of map projection. Conformal projection, Equal area projection and Equidistant projection.	M4.03	U																				

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