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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

BASIC SURVEYING

[Maximum marks: 75] [Time: 3 Hours]

PART A

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

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	Define tie line.	M1.02	R
2	……. is a graphical method of survey in which field work and plotting are done simultaneously.	M1.04	R
3	List any two advantages of plane table surveying.	M1.04	R
4	In surveyor's compass graduations are in …… system.	M2.01	R
5	List out any two methods for balancing the traverse.	M2.04	R
6	Parallax can be eliminated by ……..	M3.02	R
7	Define benchmark.	M3.02	R
8	Define check levelling.	M4.01	R
9	…….. levelling is performed when the distance between two points is more and points are not inter visible.	M4.01	U

PART B

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

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Briefly explain the primary classification of surveying.	M1.01	U
2	List out the different types of tapes used in surveying.	M1.03	R
3	Write down the methods of plane table surveying and its suitability.	M1.04	R
4	List out the factors affecting selection of survey stations.	M1.03	R
5	Explain any one method used for orientation of plane table.	M1.04	U
6	The magnetic bearing of a line AB is 48° 24'. Calculate the true bearing if the magnetic declination is 5° 38' East.	M2.02	U
7	List out the methods used for plotting compass survey.	M2.03	R
8	Briefly explain different types of benchmarks.	M3.02	U
9	Describe reciprocal levelling with the help of a neat sketch.	M4.01	R
10	Write a note on cross sectional levelling.	M4.01	R

PART C

Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

<table>
<tr><th></th><th></th><th>Module outcome</th><th>Cognitive level</th></tr>
<tr><td>III</td><td>Explain with neat sketch the method of radiation in plane table survey.
OR</td><td>M1.04</td><td>U</td></tr>
<tr><td>IV</td><td>A chain line ABC crosses a river. Points B and C are on the banks of the river. From a point D outside the line ABC, a perpendicular BD is drawn. Length BD is 40m. If<CDA is 90° and length AB is 35m, determine the width of the river BC.</td><td>M1.03</td><td>U</td></tr>
<tr><td>V</td><td>List the different methods of balancing a traverse. Explain the method to be used when the angular measurement are more precise than the linear measurements.
OR</td><td>M2.04</td><td>U</td></tr>
<tr><td>VI</td><td>Differentiate quadrantal bearing system and whole circle bearing system and convert the following quadrantal bearing to whole circle bearings: (a) S 31° 36’E (b) N 5° 42’ W</td><td>M2.02</td><td>U</td></tr>
<tr><td>VII</td><td>The following bearings were observed during a traverse survey for a closed traverse. Compute the included angles and also sketch the traverse.
<table>
<tr><th>Side</th><th>Fore bearing</th><th>Back bearing</th></tr>
<tr><td>AB</td><td>135° 0’</td><td>315° 0’</td></tr>
<tr><td>BC</td><td>60° 30’</td><td>240° 30’</td></tr>
<tr><td>CD</td><td>5° 30’</td><td>185° 30’</td></tr>
<tr><td>DE</td><td>294° 30’</td><td>114° 30’</td></tr>
<tr><td>EA</td><td>220° 0’</td><td>40° 0’</td></tr>
</table>
OR</td><td>M2.03</td><td>A</td></tr>
<tr><td>VIII</td><td>The following bearings were observed while traversing with a compass. Mention which stations were affected by local attraction and determine the corrected bearings.
<table>
<tr><th>Line</th><th>F.B.</th><th>B.B</th></tr>
<tr><td>AB</td><td>74° 34’</td><td>256° 10’</td></tr>
<tr><td>BC</td><td>107° 30’</td><td>286° 30’</td></tr>
<tr><td>CD</td><td>225° 10’</td><td>45° 10’</td></tr>
<tr><td>DA</td><td>306° 50’</td><td>126° 10’</td></tr>
</table></td><td>M2.03</td><td>A</td></tr>
<tr><td>IX</td><td>The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 metres. Calculate reduced level (R.L.) of points if the first reading was taken with a staff held on a B.M. of 432.384m.</td><td>M3.03</td><td>A</td></tr>
</table>

X	Use rise and fall method. **OR** The following consecutive readings were observed with a dumpy level in a continuously sloping ground at 20m interval 0.735 at A, 1.225, 1.575, 1.920, 2.560, 0.950, 1.235, 1.85, 2.75, 0.875, 1.325, 2.00 on B. The R.L. of starting point A is 120m. Determine the gradient of the line AB.	M3.03	A
XI	Compare between collimation method and rise and fall method used for computing reduced levels.	M3.03	U
	OR		
XII	Briefly explain the fundamental axes of dumpy level and its relationship.	M3.02	U
XIII	List out the permanent adjustments in a dumpy level and explain any one in detail.	M4.03	U
	OR		
XIV	Draw the cross section of road at chainage 100. The following details are given. Reduced level at chainage 100 is 50.050. Staff reading at chainage 100 is 1.250. Left side Staff readings at 3m, 6m, and 9m are 1.340, 1.425 and 1.495. Right side Staff readings at 3m, 6m and 9m are 1.230, 1.195 and 1.150.	M4.02	U

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