Faculty of Engineering
Prince of Songkla University

This is a closed book exam. Books, lecture notes, needed materials, and all other documents are definitely ***not*** allowed. However, dictionary, scientific calculator and needed stationery are exempted.

Instructions

1. There are 5 problems in this exam. (100 points)
2. Attempt all problems.
3. Books and lecture notes are not allowed.
4. Students can bring in a calculator and a dictionary.
5. Students can use pencils in the answer books.

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นาย รุจ ศุภวิไล ผู้ออกข้อสอบ

1) Describe and explain the first scientific measurement of the earth circumference. Who is the man who performs this expedition? Also explain his method and the name of the place and time of the year that his measurement took place. How well was the results of his observations?(15 points)

2) From the control stations A and B, the horizontal angles <PAB and <PBA were measured respectively. Please calculate the coordinates of the unknown station P (X_p and Y_p) by using the given field data.

From	To	Face	Horizontal Circle Readings	Horizontal Angles	Remarks
A	P	L	283° 15′ 21″		Angle α
	B	L	04° 33′ 01″		
	B	R	184° 33′ 04″		
	P	R	103° 15′ 28″		
B	A	L	333° 06′ 17″		Angle β
	P	L	37° 38′ 43″		
	P	R	217° 38′ 47″		
	A	R	153° 06′ 17″		

Given X_A = 3,369.287 m. X_B = 3,300.259 m.

Y_A = 2,890.836 m. Y_B = 3,082.183 m.   (25 points)

3) What is a "**Laplace Station**"? Explain the definition and usefulness of the Laplace station in surveying project. Also describe the type of surveying that needs the Laplace station. (10 points)

4) Describe the steps in computation for coordinates of the unknown point by the Italian's method of resection. (10 points) If it is required to write a computer program to solve for the unknowns by this method, what would you like to summarize the procedure of your computation into basic subroutines? (10 points)

5) From the given quadrilateral ABCD, please adjust the interior angles until they satisfy both geometric conditions and trigonometric condition. Also check the results of your final adjustment. Is there any improvement after the adjustment ? (30 points)

1 = 32° 21′ 21″   5 = 44° 22′ 44″

2 = 41 29 54   6 = 34 34 56

3 = 48 12 26   7 = 55 07 32

4 = 45 55 10   8 = 57 56 29

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