BOĞAZİÇİ UNIVERSITY
Physics Department
PHYL202 Applied Exam-1
THIN LENSES

Fall '26
Duration: 40 minutes

Name & Surname: _____ **Student ID:** _____
Lab Section: _____ **Table #:** _____ **Date:** _____

ATTENTION: Graded based on the data and final answers provided in the tables below. Correct answers without supporting valid calculations on the Extra Sheet get **NO** credit. Include correct significant figures (sf) and units!

REFERENCE FORMULAS:
Thin Lens: $\frac{1}{f} = \frac{1}{o} + \frac{1}{i}$ Magnification: $m = -\frac{i}{o}$ Lens Maker's: $\frac{1}{f} = \pm(n-1)\frac{2}{R}$ Spherometer: $R = \frac{D}{2} + \frac{A^2}{6D}$ $(D = |CR - MR|)$

PART I) Focal Length of the Converging Lens

Obtain a sharp image for two different positions. Record measurements and calculate f and m.

Trial	**Object Distance (o)**	**Image Distance (i)**	**Focal Length (f)**	**Magnification (m)**
1				
2				
		Average Focal Length (f_{avg}):		

PART II) Focal Length of the Diverging Lens

Use the lens combination to form an image. Measure o_1, i_2, and distance d between lenses. Calculate the intermediate image distance (i_1) and the focal length of the diverging lens (f_{div}).

Measurements:

o_1 (Object to Conv. Lens) = _____

i_2 (Div. Lens to Screen) = _____

d (Distance between lenses) = _____

Calculated Results:

i_1 =

f_{div} =

PART III) Spherometer Measurements & Refractive Index

Measure the converging lens using the spherometer. Calculate R, refractive index n, and % error (Theoretical $n_{tv} = 1.52$).

Measurements:

A (Distance between outer legs) = _____

CR (Calibration Reading) = _____

MR (Measurement Reading) = _____

Calculated Results:

D =

R =

n_{exp} =

% Error =

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EXTRA CALCULATION SHEET

Name & Surname: _____ **Student ID:** _____

Lab Section: _____ **Table #:** _____ **Date:** _____

NOTE:

This sheet is provided for your calculations to support your final answers.

Your final answers MUST be written in the designated tables and boxes on the first page.

If a final answer is correct, this sheet will be checked. NO points will be awarded for correct answers lacking valid supporting calculations.

Calculations Space (Show all steps for Part I, II, and III):