BOĞAZİÇİ UNIVERSITY

Physics Department

Fall '26

Duration: 30 minutes

PHYL102 Applied Exam 2
ANGULAR HARMONIC MOTION

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

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

ATTENTION: Complete this exam YOURSELF! Correct answers without valid calculations get **NO** credit. Be careful about units and significant figures (sf). Use parentheses in the tables to indicate units. You shall show all your formulae & calculations explicitly and express your final answers clearly.

Part 1: Moment of Inertia of the Disk (1.0 pt): *Measure & read or calculate the following values.*

Description	**Symbol (unit)**	**Value**
Time for 20 oscillations	t ( )	
Period for one oscillation	T ( )	
Diameter of the disk	D_{disk} ( )	
Radius of the disc	R_{disk} ( )	
Mass of the disc	M_{disk} ( )	

Part 2: Moment of Inertia of the Ring & Disc (1.4 pts): *Measure & read or calculate the following values.*

Description	**Symbol (unit)**	**Value**
Time for 20 oscillations	t^* ( )	
Period for one oscillation	T^* ( )	
Outer diameter of the ring	D_{outer} ( )	
Outer radius of the ring	R_{outer} ( )	
Inner diameter of the ring	D_{inner} ( )	
Inner radius of the ring	R_{inner} ( )	
Mass of the ring	M_{ring} ( )	

TOTAL SCORE

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PHYL102 Applied Exam 2: ANGULAR HARMONIC MOTION **Spring '26**

CALCULATION SHEET

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

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

Calculate the following quantities (Show your formulae & calculation explicitly!) (2.5 pts):

a) Moment of Inertia of the disk (Theoretical): $I_{disc} =$

b) Torsion constant of the rod (Empirical): $\kappa =$

c) Total Moment of Inertia of the disk and the ring (Empirical - use your κ): $I_{total} =$

d) Moment of Inertia of the Ring (Empirical - use your I_{total} and I_{disc}): $I_{ring-EV} =$

e) Moment of Inertia of the Ring (Theoretical): $I_{ring-TV} =$

Calculate the percentage error for Moment of Inertia of the Ring (1.1 pts):

Accuracy matters in this part. Show your error calculation clearly.

% Error for I_{ring} =