Two Problems in Mechanics (10 points)

Part A. The Hidden Disk (3.5 points)

A.1 (0.8 pt)

$b =$

A.2 (0.5 pt)

Equation of motion for φ :

$I_S =$

A.3 (0.4 pt)

$d =$

A.4 (0.7 pt)

$I_S =$

A.5 (1.1 pt)

$h_2 =$

$r_2 =$

Part B. Rotating Space Station (6.5 points)

B.1 (0.5 pt)

$\omega_{ss} =$

B.2 (0.2 pt)

$\omega_E =$

B.3 (0.6 pt)

$\omega =$

B.4 (0.8 pt)

$g_E(h) =$

$\tilde{\omega}_E =$

B.5 (0.3 pt)

$R =$

B.6 (1.1 pt)

$v_x =$

$d_x =$

B.7 (1.3 pt)

$H \geq$

B.8 (1.7 pt)

$x(t) =$

$y(t) =$