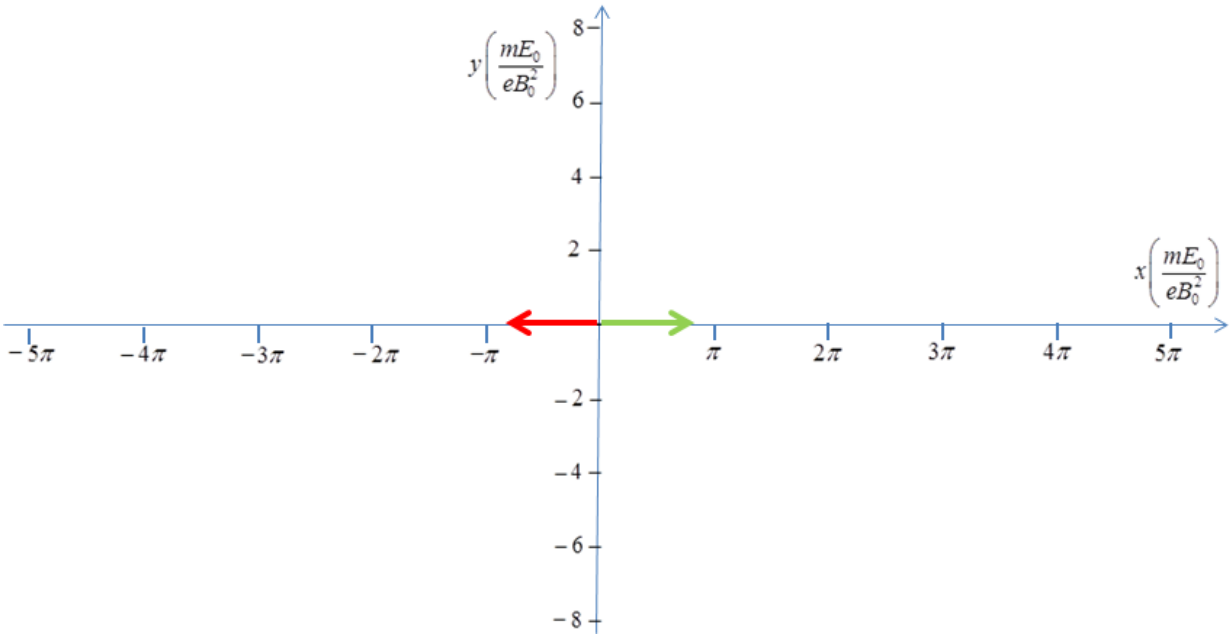
Part A: The structure and operation of a magnetron (6.6 points)

A.1 (0.4 pt)

$f_{\text{est}} =$

A.2 (1.5 pt)



1. For $\vec{u}(0) = (3E_0/B_0)\hat{x}$, have $\vec{u}_D =$
2. For $\vec{u}(0) = -(3E_0/B_0)\hat{x}$, have $\vec{u}_D =$

A.3 (0.4 pt)

$r =$

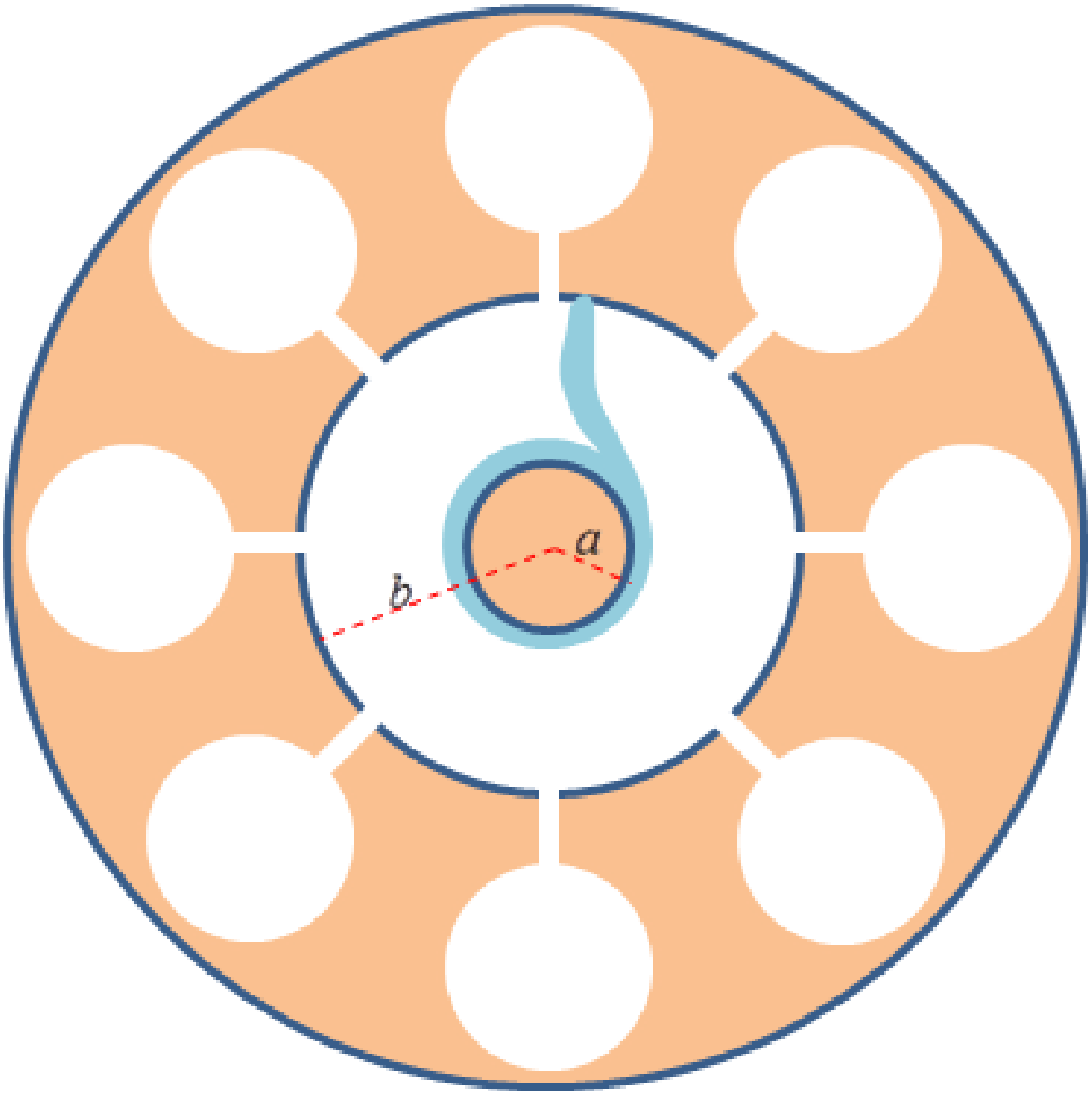
A.4 (1.2 pt)

point	toward the anode	toward the cathode	perpendicular to the radius
A			
B			
C			
D			
E			

A.5 (1.2 pt)

points	angle decreases	angle increases	indeterminate
AB			
BC			
CA			
DE			
EF			
DF			

A.6 (0.8 pt)



$\omega_s =$

A.7 (1.1 pt)

$V_0 =$

Part B: The interaction of microwave radiation with water molecules (3.4 points)

B.1 (0.5 pt)

$\tau(t) =$

$H_i(t) =$

B.2 (0.5 pt)

$\langle H(t) \rangle =$

B.3 (1.1 pt)

$I(z) =$

B.4 (0.6 pt)

$\beta =$

B.5 (0.7 pt)

$z_{1/2} =$

material	$z_{1/2}$ increases with temp.	$z_{1/2}$ decreases with temp.	$z_{1/2}$ remains the same
water			
soup			