Intent behind the problem is to explore the uncertainties involved in Brachytherapy
First point is to do measurements that are possible in the clinic
The general dosimetry formulism is TG 43- the equation is below
TG 43 equation

$$\dot{D}(r,\theta) = S_K \Lambda \frac{G_L(r,\theta)}{G_L(r_0,\theta_0)} g_L(r) F(r,\theta)$$

The physicist can measure a value of the air kerma strength, S_K
The other parameters are consesus values and are in the treatment planning system
The leakage is measured and either does not change which makes an unceertainty contribution of 0 or it would be the limit of the reading accuracy which then would be 0.05%. We will use a value of 0.
so given the readings, we are dealing with the following data

Readings	Reading / sec	leakage	RDG (A) minus leakage
2.2712E-10	3.7853E-12	-2.00E-15	3.7873E-12
2.28090E-10	3.8015E-12	-2.00E-15	3.8035E-12
2.2829E-10	3.8048E-12	-2.00E-15	3.8068E-12
2.2829E-10	3.8048E-12	-2.00E-15	3.8068E-12
		average	3.8011E-12
		std dev	9.336E-15

Thus, S_K is determined by the following equation, where Rdg is the average above

$$\mathbf{S_k = Rdg * N_{sk} * k_e * k_{tp}}$$

N_{Sk} =2.361E11 µGy-m2.h/A:
k_e=1.001 for electrometer
Temperature = 21.6 C
Pressure = 98.62 kPa
Therefore the k_{TP} is given by P = (P_0/ P)((T+273.15)/(22+273.15)
k_{TP} = 1.022672
therfore S_K = 9.1871E-01 or 0.919 µGy-m^2.h

The uncertainty table for $S_{K\ in\ \%}$ is therefore

parameter	Type A	type B	comment
leakage		0	Assumed
Rdg	0.25		
Cal coeff Nsk		1.175	
Electro cal coeff		0.19	
Temperature	0.462963		
Pressure	0.2028		
	0.31796258	1.416725	
Type A &B k=1. u for Sk	1.32		

thus clinic determines S_K with an uncertainty of 1.32 % k=1

Now determine the uncertainty for 1 seed at the point at 90 which is 0.5 and 5.0 from the source

parameter	Type A	type B
S_K		1.32
Data consensus		3

Uncertainty for 0.5cm at 90	3.28
Uncertainty for 0.5cm at 90 at k=2	6.56

Now determine the uncertainty for 1 seed at the point at 90 which is 5.0 from the source

parameter	Type A	type B
S_K		1.32
Data consensus		4

Uncertainty for 0.5cm at 90	4.21
Uncertainty for 0.5cm at 90 at k=2	8.42