

QUESTION 5

A common type of portable beta-gamma survey instrument uses an air ionization chamber vented to atmospheric pressure. The cylindrical detector is 3 inches high and 3 inches in diameter with a 7 mg/cm² beta window and a 400 mg/cm² beta shield. The side walls are 600 mg/cm².

Answer the questions below with respect to the instrument's response versus the "true" dose rates specifically associated with the following conditions.

POINTS

- 1 A. Briefly describe a potential source of error associated with measuring gamma and beta dose rates while moving in and out of a noble gas environment.

- 1 B. List and briefly explain two harsh environmental conditions which could have an adverse effect on the accuracy of the instrument response while in the area.

- 1 C. Briefly describe the most significant source of error associated with measuring true beta and gamma surface dose rates from contact measurements of small sources.

- 1 D. Briefly explain a source of error associated with measuring beta dose rates from large area sources, with each source comprised of a different radionuclide.

- 1 E. Briefly describe a source of error associated with measuring beta dose rates from high energy beta sources using open minus closed window readings.