Section 2

Regarding effective dose (ED) and effective dose equivalent (EDE), which is NOT true?

A. The tissue-weighting factor assigned to the gonads has decreased over the years.



B. The traditional unit for both ED and EDE is the rem.



C. More tissues/organs are included in the newer sets of tissue weighting factors.



D. The radiation-weighting factor for beta particles is 20. Is 1

Select the correct S.I. unit for the tradition unit of 1 roentgen:

A. 2.58E04 Coulomb/kg



B. 2.58E-04 Coulomb/kg



C. 2.22E04 Coulomb/kg



D. 2.22E-04 Coulomb/kg

You are using a Cs-137 source that was calibrated at 80 millicuries on June 5, 1977.  The half-life of Cesium 137 is 30 years.  What is the activity on June 5, 2007?

A. 40 microcuries



B. 400 millicuries



C. 40 millicuries



D. 4 microcuries

X-ray

All above

The half-life of a radionuclide is 2 days. What fraction of the original amount remains after 8 days?

1/16

A charged particle can interact with matter by

A. Excitation



B. Ionization



C. Bremsstrahlung



D. All of the above

Select the correct S.I. unit for the tradition unit of 1 rem:

A. 0.10 sievert



B. 10 sievert



C. 100 sievert



D. 0.01 sievert

During the process of pair production, the primary x-ray or gamma ray must have energy greater than the sum of the energy of one electron and one positron. This energy, also known as the “rest mass energy” is

A. 0.250 MeV



B. 0.511 MeV



C. 1.022 MeV



D. 2.511 MeV

Which of the following is NOT a mode of radioactive decay?

A. Positron



B. Alpha



C. Pair production



D. Nuclear transition



E. Electron capture

In one month, you are exposed to 52 mrem of external x-ray radiation.    
You also accidentally ingest some P-32, which gives you a CEDE of   
83 mrem.  What is your TEDE for the month?

A. 83 mrem



B. 52 mrem



C. 31 mrem



D. 135 mrem

A particle has a high specific ionization. Which of the following is true?

A. It is probably a gamma ray.



B. It has a short range in matter.



C. It has a very low mass.



D. All of the above.

Which of the following is FALSE?

A. Activity is the number of atoms decaying per unit time.



B. Activity decreases over time.



C. The SI unit of activity is the curie.



D. 1 curie = 3.7 x 1010 Bq

Some radiation quantities are true measurements and others are calculated quantities. Which of the following can be measured directly?

A. Count rate



B. Exposure



C. Effective dose



D. Both A and B



E. All of the above

Select the correct S.I. unit for the tradition unit of 1 curie:

A. 3.7E10 becquerel



B. 37E10 becquerel



C. 370E10 becquerel



D. 2.22E10 becquerel

The activity of a radionuclide is 1 millicurie (2.22E9 dpm).

The half-life is 100 minutes.  How many atoms are present in the sample?

A. 3.2E11 atoms



B. 2.2E14 atoms



C. 2.58E10 atoms



D. 6.02E23 atoms

The specific ionization of an alpha particle in air is about 45,000 ion pairs/cm.  An 8 MeV alpha particle produces about 228,000 ion pairs.   How far will it travel in air?

A. 5 cm



B. 5 mm



C. 5 m



D. 50 cm

Which of the following is true regarding deuterium and tritium?

A. Both are radioactive.



B. Both are isotopes of hydrogen.



C. Deuterium has more neutrons.



D. Tritium has more protons

Which two decay modes can occur when an atom has too many protons?

A. Beta minus decay and nuclear transition



B. Beta plus decay and electron capture



C. Alpha decay and nuclear transition



D. Beta minus decay and beta plus decay

Which of the following is NOT a characteristic commonly used to describe radiation?

A. Energy



B. Ability to ionize matter



C. Type (particulate or electromagnetic)



D. Strength of the magnetic field

Taking radiation weighting factors into consideration, what would the equivalent dose be to an individual receiving an exposure of 8 mR of gamma radiation, 5 mrad of beta particles, and 2 mrad of alpha particles.

A. 15 mrem



B. 53 mrem



C. 15 mrad



D. 53 mrad



E. 106 mrem



