

Radioactivity

35. When a radionuclide decays, radiation is emitted from the:
- A. Outer orbital electrons of the atom
 - B. Innermost shell of the atom
 - C. The nucleus of the atom
 - D. All of the above
36. The half-life of a radionuclide is the time required to reduce:
- A. The volume of the isotope into half
 - B. The number of radioactive atoms to half of their initial number
 - C. The activity to half of its initial value
 - D. B and C are true
 - E. A, B, C all are true
37. If the activity in a sample of a radionuclide is 100 mCi, how many half-lives would be required for it to decay to less than 2 mCi:
- A. 3
 - B. 4
 - C. 5
 - D. 6
38. Samples of two radionuclides with different half-lives initially contain the same number of radioactive nuclei. The sample with the longer half-life will have:
- A. A shorter biological half-life
 - B. A longer average life time
 - C. Produce a higher exposure rate
 - D. A higher activity
39. The disintegration constant λ is equal to:
- A. Physical half-life \times 1.44
 - B. Biological half-life \times .0693
 - C. Physical half-life \times 0.693
 - D. $0.693/\text{physical half-life}$
40. The dose delivered to an internal organ is a function of:
- A. Organ uptake
 - B. Activity administered
 - C. Biological half-life
 - D. Physical half-life
 - E. All of the above

41. Specific activity of a radionuclide refers to:
- A. Number of disintegrations per second
 - B. Number of grams per Ci
 - C. Activity per unit mass
 - D. Number of atoms per centimeter cube
42. If the specific activity in a sample decreases, its:
- A. Half-life decreases
 - B. Physical life increases
 - C. Activity per gram of the material decreases
 - D. All of the above
43. The physical half-life of a radionuclide is:
- A. The same as the average life
 - B. Less than the average life
 - C. Directly proportional to the decay constant
 - D. Reciprocal of biological half-life
44. After 5 half-lives, the fraction of initial activity is reduced to:
- A. One-fifth
 - B. One-fifth to the power of 2
 - C. Square root of $1/2$
 - D. $1/2$ to the power of 5