

## 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  $\lambda$  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