

Question 1

1. Chemical reactions usually involve much higher energies than nuclear reactions.
2. True
3. False

2 points

Question 2

4. Cobalt-60 (Co-60) emits gamma radiation. What isotope is the product of this emission?

		Manganese-60 (Mn-60)
		Iron-60 (Fe-60)
		Cobalt-60 (Co-60)
		Nickel-60 (Ni-60)

2 points

Question 3

5. Phosphorus-28 (P-28) emits positrons. What isotope is the product of this emission?

		Aluminum-28 (Al-28)
		Silicon-28 (Si-28)
		Phosphorus-28 (P-28)
		Sulfur-28 (S-28)

2 points

Question 4

6. A nitrogen-16 (N-16) nucleus undergoes beta decay. A product of this reaction is an oxygen-17 (O-17) nucleus.
7. True
8. False

2 points

Question 5

9. Which of the following is probably the most stable atom?

		A nitrogen-11 atom
		A nitrogen-12 atom
		A nitrogen-13 atom
		A nitrogen-14 atom

2 points

Question 6

10. When radioactive radon-222 (Rn-222) emits an alpha particle, the remaining atom is _____.
(Fill in the blank)

		bismuth (Bi)
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		lead (Pb)
		polonium (Po)
		astatine (As)

2 points

Question 7

11. ^{131}I has a half-life of 8 days. Approximately how much of a 2.00 gram sample will be left in 40 days?

		0.25g
		0.13g
		0.06g
		0.03g
		0.02g

2 points

Question 8

12. Spontaneous disintegration of unstable nuclei

		results in new chemical compounds
		is called natural radioactivity
		leads to nuclear fusion
		only occurs in the lightest elements
		occurs at no measurable rate

2 points

Question 9

13. The decomposition of ^{238}U produces ^{234}Th and _____. (Fill in the blank)

		an alpha particle
		a beta particle
		two alpha particles
		an alpha and a beta particle
		none of the above are correct

2 points

Question 10

14. The isotope ^{206}Pb (lead-206) has

		82 protons, 124 neutrons and 82 electrons
		124 protons, 82 neutrons and 82 electrons
		124 protons, 82 neutrons and 124 electrons
		82 protons, 82 neutrons and 124 electrons

2 points

Question 11

15. A radioactive sample that weighs 20 grams has a half-life of 5 hours. How much of the sample will remain after 15 hours of decay?

		2.5 grams
		5.0 grams
		6.67 grams
		10 grams

2 points

Question 12

16. You have a radioactive sample that weighs 400 grams. How many half-lives of this sample must pass for the sample decays to 12.5 grams?

		Four half-lives
		Five half-lives
		Ten half-lives
		Sixteen half-lives

2 points

Question 13

17. You are given 8.00 grams of a radioactive sample. The sample decays for three half-lives. How much of the radioactive sample will remain?

		4.00 grams
		2.00 grams
		1.00 gram
		0.5 gram

2 points

Question 14

18. A carbon-12 nucleus is probably more stable than a carbon-10 nucleus.

19. True

20. False

2 points

Question 15

21. Radioactivity is associated with which part of the atom?

		The electrons
		The entire atom
		The nucleus
		Radioactivity does not come from atoms

2 points

Question 16

22. Radiation intensity refers to the number of disintegrations or decays of radioactive material per unit time.

23. True

24. False

2 points

Question 17

25. What is the mass number of a beta particle?

		-1
		0
		1
		2

2 points

Question 18

26. An electromagnetic wave with a high frequency has higher energy than an electromagnetic wave with low frequency.

27. True

28. False

2 points

Question 19

29. Nuclear fusions is the process used to produce energy in commercial nuclear power plants.

30. True

31. False

2 points

Question 20

32. A hydrogen-2 nucleus undergoes a fusion reaction with a hydrogen-3 nucleus to form a hydrogen-4 nucleus. What is the other product of this reaction?

		A beta particle
		A neutron
		A hydrogen-1 nucleus
		A positron