Name:_____ **Period:**_____

Ch. 10 HW Packet

Nuclear Decay (pages 292–293) #1

1. Describe radioactivity._____

_____

2. A radioisotope is any atom that contains an unstable _____.

3. Describe what happens to radioisotopes during nuclear decay. _____

_____

Types of Nuclear Radiation (pages 293–296)

4. Nuclear radiation is charged particles and energy that are emitted from the _____ of radioisotopes.

5. Circle the letters that identify each common type of nuclear radiation.

a. X-rays b. alpha particles

c. beta particles d. gamma rays

6. Circle the letters that identify which groups of particles make up an alpha particle.

a. two electrons b. two protons

c. two neutrons d. four neutrons

7. Circle the letters that identify each event that takes place during beta decay.

a. A proton decomposes into a neutron and an electron.

b. A neutron decomposes into a proton and an electron.

c. An electron is emitted from the nucleus.

d. A neutron is emitted from the nucleus.

8. Why are beta particles more penetrating than alpha particles?

_____

10. What is a gamma ray? _____

_____

11. How fast do gamma rays travel through space?

_____

Effects of Nuclear Radiation (pages 296–297)

12. How does nuclear radiation affect atoms? _____

_____

Detecting Nuclear Radiation (page 297)

15. Name two devices that are used to detect nuclear radiation.

a. _____ b. _____

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Half-life (pages 299–300) #2

1. Is the following sentence true or false? All radioisotopes decay at the same rate._____

2. Describe a half-life._____

_____

3. Circle the letter that describes a sample of a radioisotope after two half-lives.

a. One eighth of the original sample is unchanged.

b. One quarter of the original sample is unchanged.

c. Half of the original sample is unchanged.

d. Three quarters of the original sample is unchanged.

4. Circle the letter of the correct answer. Iodine-131 has a half-life of 8.07 days. What fraction of a sample of iodine-131 is left unchanged after 16.14 days?

a. $\frac{1}{2}$ b. $\frac{1}{4}$

c. $\frac{1}{8}$ d. $\frac{1}{16}$

Use the following table to answer questions 7 and 8.

Half-Lives of Selected Radioisotopes	
Isotope	**Half-life**
Radon-222	3.82 days
Iodine-131	8.07 days
Thorium-234	24.1 days
Radium-226	1620 years
Carbon-14	5730 years

5. Circle the letter that identifies which sample would be the most unchanged after 100 years.

a. iodine-131 b. radium-226

c. radon-222 c. thorium-234

6. Circle the letter of the correct answer. How much of a 1.00 gram sample of radium-226 is left unchanged after 4860 years?

a. 0.500 b. 0.250 g

c. 0.125 g c. 0.050 g

Radioactive Dating (pages 300–301)

10. Circle the letter that identifies the correct equation for the beta decay of carbon–14.

a. ${}^{14}_{6}C \rightarrow {}^{14}_{7}N + {}^{0}_{-1}e$ b. ${}^{14}_{6}C \rightarrow {}^{13}_{5}B + {}^{1}_{1}P$

c. ${}^{14}_{6}C \rightarrow {}^{14}_{5}N + {}^{0}_{-1}e$ c. ${}^{14}_{6}C \rightarrow {}^{10}_{4}Be + {}^{4}_{2}H_{e}$

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