

## Radiation : Review-40

1) What is radiation?

2)a) How is electromagnetic radiation created?

b) Name five types of electromagnetic radiations.

c) Which has a higher energy; X-rays or microwaves?

d) Which has the shortest wavelength; orange light or green light?

e) Give the approximate wavelength of AM radio waves.

f) What is the speed of electromagnetic waves?

3)a) Which type of wave is used to look at broken bones?

b) Which type of wave is used in radar?

c) Which type of wave is needed by plants?

d) This wave can cause a sunburn.

e) Your body radiates this type of electromagnetic wave.

4)a) What is radioactivity?

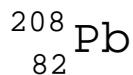
b) What is an isotope?

c) Which three types of radiations are emitted by a radioactive nucleus?

d) Are all isotopes radioactive?

e) Give the structure and charge of the alpha particle.

f) A certain isotope is given by the formula;



The name of the element is \_\_\_\_\_. The atomic number is \_\_\_\_\_. The mass number is \_\_\_\_\_. The number of protons is \_\_\_\_\_. The number of neutrons is \_\_\_\_\_. The number of electrons is \_\_\_\_\_.

g) Americium-241 is an alpha emitter. After it decays, it changes into a new element. Name the element (give mass number). \_\_\_\_\_.

h) What is the usual mass number of arsenic? \_\_\_\_\_ (see atomic weight in the periodic table)

5) Sodium-24 has a half-life of 15 hours. If we start with 0.128 grams at time  $t = 0.0$ , how much of the isotope (in grams) will be left after the following times?

a) 15 hours

b) 30 hours

c) 60 hours

Answers: 1) It is the transfer of energy., 2)a) Electromagnetic waves are created when charges move back and forth., b) radio, microwave, infra red, visible light, ultra violet, X-rays, gamma rays., c) X-rays, d) green (it is closer to blue), e)  $10^2$  m or 100 meters, f) They move at the speed of light which is  $3.0 \times 10^8$  m/s, 3)a) X-rays, b) radio, c) light (especially red light), d) ultra violet, e) infra red (it is heat!), 4)a) It is the emission of radiation by an unstable nucleus., b) These are elements with differing numbers of neutrons., c) alpha, beta, and gamma, d) No! (e.g. carbon-12 is not radioactive but carbon-14 is), e) It is a helium nuclei. It is made up of two neutrons and two protons. The charge is +2., f) lead, 82, 208, 82, 126, 82, g) Neptunium-237, (atomic number decreases by 2, mass number decreases by 4), h) 75 a.m.u., 5)a) 0.064, 0.032, 0.008.