Radiation Protection in Medical Radiography 8th edition Sherer Test Bank

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MULTIPLE CHOICE

1. If ionizing radiation from natural sources grows larger because of accidental or deliberate human actions such as mining radioactive elements, the sources are termed
   a. artificial sources.
   b. enhanced natural sources.
   c. extraterrestrial sources.
   d. manmade sources.

   ANS: B

2. Electromagnetic radiation travels or propagates through space in the form of a wave but can interact with matter as a particle of energy called a photon. This dual nature is referred to as
   a. wave attenuation capability.
   b. wave-particle interchange ability.
   c. wave-particle duality.
   d. wave-particle phenomena.

   ANS: C

3. Which of the following statements concerning the 1979 nuclear reactor accident at TMI-2 is *not* true?
   a. Many excess cancer deaths have been predicted to occur in the 2 million people living within 50 miles of the plant at the time of the accident.
   b. During the time of the accident, if persons living within a 100-mile radius of the nuclear power plant received an average radiation exposure of 15 microgray, and this dose is used as the population dose, then no more than two additional resulting cancer deaths can be predicted in the exposed inhabitants as a consequence of radiation exposure.
   c. The average dose received by the exposed population living within a 50-mile radius of the TMI nuclear power station at the time of the accident was determined to be 0.08 mSv, which is well below the average annual background level.
   d. No melt-through of the reactor vessel resulted during the accident.

   ANS: A

4. Terrestrial radiation includes which of the following sources?
   a. Long-lived radioactive elements such as uranium-238, radium-226, and thorium-232 that are present in variable quantities in the crust of the earth
   b. Radioactive fallout from nuclear weapons tests in which detonation occurred above ground
   c. The sun and beyond the solar system
   d. Airport surveillance systems and electron microscopes

   ANS: A

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5. The Environmental Protection Agency (EPA) recommends that action be taken to reduce elevated levels of radon in homes to a concentration *less than*
   a. 200 pCi/L.
   b. 135 pCi/L.
   c. 47 pCi/L.
   d. 4 pCi/L.

   ANS: D

6. Cosmic radiation occurs in which two forms?
   a. Solar and manmade
   b. Artificial and galactic
   c. Natural background and artificial
   d. Solar and galactic

   ANS: D

7. As a result of technologic advances since the 1970s and strict regulations imposed within the United States by the FDA regarding consumer products containing radioactive material, the radiation exposure of the general public from such produces may now be considered
   a. substantial.
   b. moderate.
   c. very slight.
   d. negligible.

   ANS: D

8. Through which of the following routes can radon enter houses?
   1. Crawl spaces under living areas
   2. Floor drains and sump pumps
   3. Porous cement block foundations
   a. 1 and 2 only
   b. 1 and 3 only
   c. 2 and 3 only
   d. 1, 2, and 3

   ANS: D

9. Acute melting of the uranium dioxide fuel of a nuclear reactor core requires how great a temperature?
   a. Less than 500° F
   b. At least 1000° F
   c. 2000° F
   d. Greater than 5000° F

   ANS: D

10. When exposed to high radon levels in the home, which of the following groups of people have the highest risk of developing lung cancer?
    a. Teenagers
    b. Adults from 20 to 30 years of age
    c. Nonsmokers

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d. Smokers

ANS: D

11. Which of the following helps shield the global population from exposure to essentially all high-energy, bombarding cosmic rays?
    a. Clouds
    b. Fog
    c. Atmosphere and magnetic field of the Earth
    d. Smog

    ANS: C

12. Which of the following is considered by the EPA to be the second leading cause of lung cancer in the United States?
    a. Annual PA and lateral chest radiographic images
    b. Cosmic ray exposure
    c. Radon exposure
    d. A fluoroscopic examination of the upper gastrointestinal tract

    ANS: C

13. Which of the following are forms of electromagnetic radiation?
    1. Microwaves
    2. Visible light
    3. X-rays
    4. Gamma rays
    5. Ultraviolet radiation
    a. 1, 2, and 3 only
    b. 2, 3, and 4 only
    c. 3, 4, and 5 only
    d. 1, 2, 3, 4, and 5

    ANS: D

14. What is the most common unit of measure of equivalent dose?
    a. Coulomb per kilogram
    b. Milligray
    c. Millisievert
    d. Microsievert

    ANS: C

15. In the electromagnetic spectrum, higher frequencies are associated with
    a. longer wavelengths and lower energies.
    b. longer wavelengths and higher energies.
    c. shorter wavelengths and lower energies.
    d. shorter wavelengths and higher energies.

    ANS: D

16. Which of the following radiation quantities use the same unit of measure?
    1. Effective dose and equivalent dose

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2. Exposure and effective dose
3. Absorbed dose and equivalent dose

a. 1 only
b. 2 only
c. 3 only
d. 1, 2, and 3

ANS: A

17. A flight on a typical commercial airliner results in an equivalent dose rate of
a. 0.001 to 0.005 mSv/hr.
b. 0.005 to 0.01 mSv/hr.
c. 0.02 to 0.04 mSv/hr.
d. 0.05 to 0.09 mSv/hr.

ANS: B

18. The first decay product of radium is
a. cesium.
b. radon.
c. strontium.
d. x-ray.

ANS: B

19. When spread over the inhabitants of the United States, fallout from nuclear weapons tests and other environmental sources along with other manmade radiations contributes
a. only a small portion of 0.1 mSv to the equivalent dose of each person.
b. a dose of approximately 1.5 mSv to the equivalent dose of each person.
c. a dose of approximately 3.2 mSv to the equivalent dose of each person.
d. a dose of approximately 6.3 mSv to the equivalent dose of each person.

ANS: A

20. What is the total average annual radiation equivalent dose for estimated levels of radiation exposure for humans?
a. 2.0 mSv
b. 3.2 mSv
c. 6.3 mSv
d. 9.6 mSv

ANS: C

21. The mass of an alpha particle is approximately
a. two times the mass of a hydrogen atom and a negative charge of minus 2.
b. four times the mass of a hydrogen atom and a positive charge twice that of an electron.
c. six times the mass of a hydrogen atom and a negative charge of minus 1.
d. eight times the mass of a hydrogen atom and a positive charge four times that of an electron.

ANS: B

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22. What is the half-life of radon-220?
    a. 54.5 seconds
    b. 8 days
    c. 2 years
    d. 1622 years

    ANS: A

23. Which of the following sources of radiation is manmade?
    1. Atmospheric fallout from nuclear weapons testing
    2. Cosmic radiation from the sun and beyond the solar system
    3. Nuclear power plant accidents as a consequence of natural disasters
    a. 1 and 2 only
    b. 1 and 3 only
    c. 2 and 3 only
    d. 1, 2, and 3

    ANS: B

24. What is the latent period for most radiation-induced cancers?
    a. 1 year
    b. 5 years
    c. 7 years
    d. 15 years or more

    ANS: D

25. Of the two sources of ionizing radiation listed below, which source remains fairly constant from year to year?
    a. Manmade
    b. Natural

    ANS: B

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