

*Test Bank for Bushong's Radiologic
Science for Technologists 13th Edition
by Bushong, Shields*

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Test Bank - Chapter 01

Q1: Matter is measured in _____.

A. kilograms (Correct)

B. joules

C. electron volts

D. rems

Rationale: Matter is measured in kilograms.

Q2: Atoms and molecules are the fundamental building blocks of _____.

A. energy

B. radiation

C. matter (Correct)

D. gravity

Rationale: Atoms and molecules are the fundamental building blocks of matter.

Q3: Ice and steam are examples of two forms of _____.

A. matter (Correct)

B. radiation

C. energy

D. work

Rationale: Ice and steam are examples of two forms of matter.

Q4: The formula $E = mc^2$ is the basis for the theory that led to the development of _____.

A. x-rays

B. electromagnetic radiation

C. nuclear power (Correct)

D. cathode ray tubes

Rationale: The formula $E = mc^2$ is the basis for the theory that led to the development of nuclear power.

Q5: Radio waves, light, and x-rays are all examples of _____ energy.

A. nuclear

B. thermal

C. electrical

D. electromagnetic (Correct)

Rationale: Electromagnetic energy includes radio waves, light, and x-rays as well as other parts of the spectrum.

Q6: A moving object has _____ energy.

- A. potential
- B. kinetic (Correct)**
- C. nuclear
- D. electromagnetic

Rationale: A moving object has kinetic energy.

Q7: What is the removal of an electron from an atom called?

- A. Ionization (Correct)**
- B. Pair production
- C. Irradiation
- D. Electricity

Rationale: The removal of an electron from an atom is called ionization.

Q8: Ionizing radiation is capable of removing _____ from atoms as it passes through the matter.

- A. neutrons
- B. protons
- C. electrons (Correct)**
- D. ions

Rationale: Ionizing radiation is capable of removing electrons from atoms as it passes through the matter.

Q9: The energy of x-rays is _____.

- A. thermal
- B. potential
- C. kinetic
- D. electromagnetic (Correct)**

Rationale: X-rays are a form of electromagnetic energy.

Q10: The biggest source of man-made ionizing radiation exposure to the public is _____.

- A. atomic fallout
- B. diagnostic x-rays (Correct)**
- C. smoke detectors
- D. nuclear power plants

Rationale: Medical x-ray exposure is the biggest source of man-made radiation.

Q11: In the United States, we are exposed to _____ mSv/year of ionizing radiation from the natural environment.

A. 0 to 5 (Correct)

B. 5 to 20

C. 20 to 90

D. 100 to 300

Rationale: We are exposed to about 3 mSv/yr of ionizing radiation from natural environmental sources in the United States.

Q12: _____ is a special quantity of radiologic science.

A. Mass

B. Velocity

C. Radioactivity (Correct)

D. Momentum

Rationale: Radioactivity is a special quantity of radiologic science.

Q13: Today, radiology is considered to be a(n) _____ occupation.

A. safe (Correct)

B. unsafe

C. dangerous

D. high-risk

Rationale: Today, radiology is considered to be a safe occupation because of effective radiation protection practices.

Q14: What does ALARA mean?

A. All Level Alert Radiation Accident

B. As Low As Reasonably Achievable (Correct)

C. Always Leave A Restricted Area

D. As Low As Regulations Allow

Rationale: ALARA means As Low As Reasonably Achievable.

Q15: Computed tomography was developed in the _____.

A. 1890s

B. 1920s

C. 1970s (Correct)

D. 1990s

Rationale: Computed tomography was developed in the 1970s.

Q16: Filtration is used to _____.

- A. absorb low-energy x-rays (Correct)**
- B. remove high-energy x-rays
- C. restrict the useful beam to the body part imaged
- D. fabricate gonadal shields

Rationale: Filtration is used to absorb low-energy x-rays.

Q17: Mass is the quantity of matter as described by its energy equivalence.

- A. True (Correct)**
- B. False

Rationale: Mass is the quantity of matter as described by its energy equivalence.

Q18: Radiation is the removal of an electron from an atom.

- A. True
- B. False (Correct)**

Rationale: Ionization is the removal of an electron from an atom.

Q19: Radiology emerged as a medical specialty because of the Snook transformer and the Crookes x-ray tube.

- A. True
- B. False (Correct)**

Rationale: Radiology emerged as a medical specialty because of the Snook transformer and the Coolidge x-ray tube.

Student Review Questions - Chapter 01

Q1: Ionization is the removal of a(n) _____ from an atom.

A. electron (Correct)

B. proton

C. neutron

D. atom

Rationale: Ionization is the removal of an electron from an atom.

Q2: Which type of energy is the energy of motion at the molecular level?

A. Kinetic energy

B. Chemical energy

C. Thermal energy (Correct)

D. Nuclear energy

Rationale: Thermal energy (heat) is the energy of motion at the molecular level.

Q3: Which type of energy is the energy released by a chemical reaction?

A. Kinetic energy

B. Chemical energy (Correct)

C. Thermal energy

D. Nuclear energy

Rationale: Chemical energy is the energy released by a chemical reaction.

Q4: _____ is the transfer of energy.

A. Heat

B. Radiation (Correct)

C. Potential energy

D. Ionization

Rationale: Radiation is the transfer of energy.

Q5: Natural environmental radiation includes which of the following?

A. Terrestrial radiation

B. Cosmic rays

C. Radon

D. All options are correct (Correct)

Rationale: Natural environmental radiation includes terrestrial radiation, cosmic rays, and radon.

Q6: Which of the following is the largest source of natural environmental radiation?

- A. X-rays
- B. Radon (Correct)**
- C. Internally deposited radionuclides
- D. Cosmic rays

Rationale: Radon is the largest source of natural environmental radiation.

Q7: Which of the following is the largest source of human-made radiation?

- A. X-rays (Correct)**
- B. Radon
- C. Internally deposited radionuclides
- D. Cosmic rays

Rationale: X-rays are the largest source of human-made radiation.

Q8: What percentage of our annual average radiation dose is attributable to medical imaging?

- A. 25%
- B. 33%
- C. 48% (Correct)**
- D. 73%

Rationale: 48% of our annual average radiation dose is attributable to medical imaging.

Q9: X-rays are _____ penetrating, invisible rays that are a form of _____ radiation.

- A. slightly; mechanical
- B. slightly; electromagnetic
- C. highly; electromagnetic (Correct)**
- D. highly; mechanical

Rationale: X-rays are highly penetrating, invisible rays that are a form of electromagnetic radiation.