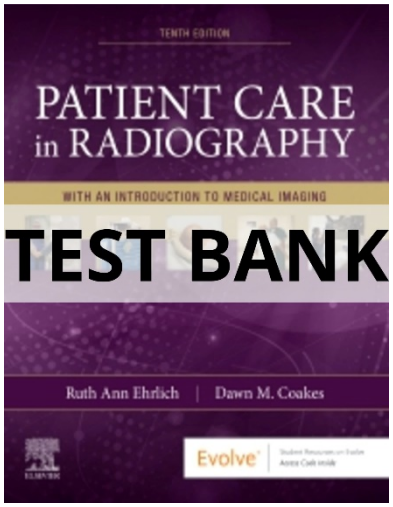
Chapter 01: Introduction to Radiography
Ehrlich: Patient Care in Radiography: With an Introduction to Medical Imaging, 10th Edition



MULTIPLE CHOICE

1. X-rays were discovered in 1895 by
   a. Coolidge.
   b. Crookes.
   c. Roentgen.
   d. Edison.

   ANS: C REF: p. 2 OBJ: 1

2. Of the following types of electromagnetic energy, which has the shortest wavelength?
   a. Radio waves
   b. X-rays
   c. Visible light
   d. Ultraviolet light

   ANS: B REF: p. 7 OBJ: 7

3. Which of the following is *not* an accurate statement regarding the characteristics of x-rays?
   a. They can penetrate matter that is impenetrable to light.
   b. They cause certain crystals to fluoresce.
   c. They can be refracted by a lens.
   d. They cannot be detected by the human senses.

   ANS: C REF: p. 7 | p. 8 OBJ: 8

4. An electron cloud surrounding a hot cathode is referred to as a(n)
   a. focusing cup.
   b. ampere.
   c. space charge.
   d. filament.

   ANS: C REF: p. 6 OBJ: 6

5. The purpose of rotating the x-ray tube target is to
   a. create a space charge.
   b. remove long-wavelength photons from the x-ray beam.
   c. focus the electron stream on a small target area.
   d. increase the heat capacity of the anode.

   ANS: D REF: p. 9 OBJ: 6

6. An imaginary photon that is emitted from the center of the focal spot, perpendicular to the long axis of the x-ray tube, is called the
   a. electron stream.
   b. x-ray beam.

c. central ray.
d. radiation field.

ANS: C REF: p. 8 OBJ: 10

7. A device used to control the size of the radiation field is a
a. collimator.
b. detent.
c. tube housing.
d. filter.

ANS: A REF: p. 8 OBJ: 11

8. The function of an x-ray grid is to
a. decrease patient radiation dose.
b. increase radiographic resolution.
c. increase radiographic contrast by reducing scatter radiation fog.
d. increase radiographic density.

ANS: C REF: p. 14 OBJ: 11

9. The majority of radiography education programs today are based in
a. proprietary schools.
b. hospitals.
c. clinics.
d. colleges.

ANS: D REF: p. 4 OBJ: 3

10. The container for the vacuum of the x-ray tube is made of
a. glass.
b. aluminum.
c. tungsten.
d. carbon.

ANS: A REF: p. 5 OBJ: 4

11. X-rays are a type of
a. electricity.
b. microwave.
c. kinetic energy.
d. electromagnetic energy.

ANS: D REF: p. 6 OBJ: 7

12. The frequency of an electromagnetic sine wave is defined as
a. the distance from trough to crest.
b. the distance from one crest to the next.
c. the number of times per second that a crest passes a given point.
d. the velocity at which the wave travels through space.

ANS: C REF: p. 6 OBJ: 9

13. Which formula represents the relationship between the wavelength, frequency, and velocity of an electromagnetic wave?
    a. $f = \lambda \times v$
    b. $V = \lambda \times f$
    c. $\Lambda = f \div v$
    d. $f = \lambda \div v$

    ANS: B REF: p. 6 OBJ: 9

14. Which of the following substances is most readily penetrated by x-rays?
    a. Water
    b. Air
    c. Bone
    d. Fat

    ANS: B REF: p. 7 OBJ: 8

15. Grids or buckys are generally used for body parts that measure greater than
    a. 2 to 4 cm.
    b. 10 to 12 cm.
    c. 18 to 20 cm.
    d. 30 cm.

    ANS: B REF: p. 15 OBJ: 11

16. The access point for the radiographer to determine the exposure factors and to initiate the exposure is called the
    a. transformer.
    b. image receptor unit.
    c. control console.
    d. stationary grid.

    ANS: C REF: p. 16 OBJ: 11

17. An x-ray machine designed for direct viewing of the x-ray image is called a(n)
    a. image receptor.
    b. transformer.
    c. control console.
    d. fluoroscope.

    ANS: D REF: p. 17 OBJ: 11

18. A device located between the x-ray tube and the control panel that increases the voltage delivered from the power company is called a
    a. collimator.
    b. transformer.
    c. control console.
    d. fluoroscope.

    ANS: B REF: p. 16 OBJ: 11

19. The anode or positive end of the x-ray tube is the end that contains the
    a. target.

b. filament.
c. focusing cup.
d. space charge.

ANS: A REF: p. 6 OBJ: 5

20. Who invented the fluoroscope and investigated hundreds of fluorescent materials?
a. Coolidge
b. Pupin
c. Roentgen
d. Edison

ANS: D REF: p. 3 OBJ: 2

21. Who invented the hot cathode x-ray tube, the prototype of modern x-ray tubes?
a. Coolidge
b. Pupin
c. Roentgen
d. Edison

ANS: A REF: p. 3 OBJ: 2

22. What is another term for remnant radiation?
a. Scatter
b. Primary
c. Exit
d. Differentiated

ANS: C REF: p. 7 OBJ: 10

23. Which type of radiation forms the x-ray image?
a. Primary
b. Remnant
c. Secondary
d. Scatter

ANS: B REF: p. 7 OBJ: 10

Chapter 02: Image Quality Factors
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MULTIPLE CHOICE

1. An x-ray exposure is made using the following factors: 200 mA, 0.04 seconds, 80 kVp, and 48 inches SID. In this case, which represents the value of the mAs?
a. 0.08
b. 0.8
c. 8
d. 16,000

ANS: C REF: p. 22 OBJ: 3

2. An increase in OID will result in

1. increased magnification.
2. decreased image detail.
3. increased image detail.

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

ANS: C REF: p. 30 OBJ: 6

3. Which term is defined as a measure of current flow rate in the x-ray tube circuit?
   a. mAs
   b. kVp
   c. Exposure time
   d. Milliamperage

   ANS: D REF: p. 25 OBJ: 1

4. In order to increase the penetration of the x-ray beam, which factor should be increased?
   a. Kilovoltage
   b. Milliamperage
   c. mAs
   d. Exposure time

   ANS: A REF: p. 28 OBJ: 4

5. When all other exposure factors are equal, which exposure time would produce the greatest quantity of x-rays?
   a. 1 millisecond
   b. 10 milliseconds
   c. 0.1 seconds
   d. 0.01 seconds

   ANS: C REF: p. 27 OBJ: 2

6. Magnification is affected by
   a. OID only.
   b. SID only.
   c. both OID and SID.
   d. neither OID nor SID.

   ANS: C REF: p. 29 OBJ: 4 | 6 | 7

7. An image receptor that contains a photostimulable plate that is converted to an image by processing with a laser is part of a system called
   a. digital radiography (DR).
   b. computed radiography (CR).
   c. a film/screen system.
   d. digital fluoroscopy.

   ANS: B REF: p. 26 OBJ: 8

8. Radiation exposure is directly proportional to
   a. OID.