

Frommer: Radiology for the Dental Professional, 9th Edition

Chapter 02: The Dental X-Ray Machine

Test Bank

COMPLETION

1. The amount of heat produced in the x-ray tube is _____ than the amount of radiation produced.

ANS: greater

REF: 15

2. The release of electrons from the hot tungsten filament at the cathode is called the _____.

ANS: thermionic emission effect

REF: 16

3. The determination of the size and shape of the x-ray beam is called _____.

ANS: collimation

REF: 33

4. The quantity of x-ray photons produced is determined by the _____ setting.

ANS: milliamperage

REF: 31

5. The quality of the x-ray photons is determined by the _____.

ANS: kilovoltage

REF: 30

6. Because of the alternating current supplied to the x-ray tube it is considered to be _____.

ANS: self-rectified

REF: 22

7. When designing barriers it is important to remember that x-rays travel in _____ lines.

ANS: straight

REF: 6

MULTIPLE CHOICE

1. If the useful beam is not centered on the film in the patient's mouth, the result will be:

- a. foreshortening
- b. elongation
- c. collimator cutoff
- d. overlapping

ANS: C REF: 35

2. A diagnostic film is made at 10 mA and 4 impulses. The exposure that would produce the same image at 5 mA would be:

- a. 5 impulses
- b. 10 impulses
- c. 8 impulses
- d. 45 impulses

ANS: C REF: 31

3. Collimator cutoff (cone cutting) is caused by:

- a. improper horizontal angulation
- b. over filtration
- c. improper beam film alignment
- d. improper vertical angulation

ANS: C REF: 35

4. If a radiograph is described as "underpenetrated," then the error must be:

- a. excessive kVp
- b. too little mA
- c. excessive mA
- d. too little kVp

ANS: D REF: 30

5. Which of the following is used in the high-voltage circuit?
- a. a rectifier
 - b. a step-up transformer
 - c. a step-down transformer
 - d. a fuse

ANS: B REF: 25

6. Ionization occurs:
- a. when an atom gains a neutron
 - b. when the atom has no charge
 - c. when an atom loses a proton
 - d. when an atom loses an electron

ANS: D REF: 12

7. Identify the physicist who discovered x-rays:
- a. Hittorf-Crookes
 - b. Roentgen
 - c. Edison
 - d. Kells

ANS: B REF: 9

8. Examples of particulate radiation include:
- a. alpha particles
 - b. electrons
 - c. neutrons
 - d. all of the above

ANS: D REF: 2

9. The difference in the electromagnetic spectrum between x-rays and visible light lies in the:
- a. wavelength
 - b. frequency
 - c. energy
 - d. subatomic particles

ANS: A REF: 2

10. All of the following are properties of x-rays EXCEPT:
- a. x-rays are invisible
 - b. x-rays travel in wavy lines
 - c. x-rays can penetrate structures
 - d. x-rays can adversely affect human tissue

ANS: B REF: 6

11. Identify the particles that compose the nucleus of an atom:
- a. electrons and photons
 - b. electrons and protons
 - c. protons and neutrons
 - d. neutrons

ANS: C REF: 10

12. The target or focal spot in the x-ray tube can be found at the:
- a. positively charged cathode
 - b. positively charged anode
 - c. negatively charged cathode
 - d. negatively charged anode

ANS: B REF: 14

13. Identify the metal used in the focal spot of the x-ray tube:
- a. tungsten
 - b. molybdenum
 - c. copper
 - d. iron

ANS: A REF: 14

14. The total x-ray energy produced by the collision of the electrons with the target inside the x-ray tube is approximately:
- a. less than 1%
 - b. 10%–20%
 - c. 50%
 - d. 99%

ANS: A REF: 15

15. Pointed, plastic cones are not used in dental radiology because:
- a. the cones are difficult for the practitioner to line up correct anatomic structures
 - b. the cones cause the production of excess secondary and scatter radiation
 - c. the cones require a higher kVp setting on the control panel
 - d. the cones require an increase in the time setting

ANS: B REF: 28 | 29

16. The thickness of aluminum that will reduce the intensity of the x-ray beam by 50% is termed:
- a. half value layer
 - b. filtration
 - c. collimation
 - d. penetrating power

ANS: A REF: 30