

# MaxRay Handheld X-ray Systems Operator Training Exam

Employee: \_\_\_\_\_ Date: \_\_\_\_\_

Instructor: \_\_\_\_\_ Score: \_\_\_\_\_

## Instructions

Read each question carefully and choose the best answer.

A

1) ALARA is

- a. a safety principle meant to keep radiation dose to a minimum
- b. a suggested improvement to always do what is responsible
- c. the alarming point on X-ray devices
- d. the target material in X-ray devices

C

2) Which are the two primary mechanisms of X-ray interaction in patients?

- a. coherent scatter and photoelectric absorption
- b. Compton scatter and coherent scatter
- c. Compton scatter and photoelectric absorption
- d. photoelectric scatter and coherent absorption

B

3) Absorbed dose is defined as

- a. energy dissipated through Compton scatter
- b. energy absorbed per unit mass
- c. energy in the X-ray beam after attenuation of X-rays in the patient
- d. energy collected on the image receptor

D

4) What safety consideration(s) should be remembered when trying to minimize radiation exposure?

- a. Time
- b. Distance
- c. Shielding
- d. all of the above

A

5) If the operator has no options except to violate the backscatter zone, the operator should

- a. wear a lead apron
- b. not take the image
- c. get supervisory approval
- d. proceed without concern

C

6) When taking an image, the operator should stand

- a. anywhere that is convenient to get the best image
- b. to the left or right of the backscatter shield
- c. directly behind the backscatter shield
- d. none of the above

D

7) When not in use for an extended period of time, the MaxRay should be stored

- a. on the counter with the battery installed
- b. in a cabinet with the battery installed
- c. in a drawer next to the battery
- d. in a locked cabinet with the battery removed and stored separately

A

8) To maximize the backscatter safety zone, the device should be held so that the

- a. backscatter shield is parallel to the operator and close to the patient
- b. X-ray emission cone is parallel to the operator
- c. backscatter shield is perpendicular to the operator
- d. none of the above

D

9) Prior to taking an exposure, the operator should ensure that

- a. they are behind the backscatter zone
- b. the patient is properly shielded
- c. all unnecessary persons are out of the room
- d. all of the above

B

10) When trying to capture a difficult image, the operator should

- a. do whatever is necessary to get the image needed
- b. move the patient before moving the device
- c. move the device before moving the patient
- d. contact the manufacturer for advice

**B**

11) When taking an image, the operator wants a higher mAs exposure factor. The operator can

- a. adjust the mA setting
- b. adjust the exposure time setting
- c. adjust the kVp setting
- d. adjust the emission cone

**C**

12) If the operator removes their finger from the exposure button prior to the passage of the exposure time, X-ray emissions will

- a. continue until the exposure time has elapsed
- b. slowly decrease until the exposure time has elapsed
- c. stop immediately
- d. none of the above

**C**

13) Generally, film will require an exposure time

- a. equal to that of digital
- b. less than that of digital
- c. greater than that of digital
- d. greater than 1 second

**B**

14) The purpose of the backscatter shield is to protect the operator from

- a. the primary beam radiation
- b. radiation scattered from the patient
- c. both a and b
- d. neither a nor b

**D**

15) If the operator doubles the exposure time

- a. the number of scattered X-rays will double
- b. the patient dose will double
- c. the operator's exposure will double
- d. all of the above

**B**

16) X-rays are best shielded by

- a. low density material
- b. high density material
- c. human tissue
- d. scatter material

C

17) The majority of X-rays in a 60 kVp primary X-ray beam are produced by which mechanism?

- a. Compton scatter
- b. characteristic X-rays
- c. Bremsstrahlung
- d. none of the above

A

18) The glass X-ray tube provides “inherent filtration” for the primary X-ray beam. How does this filtration impact the energy profile of the emitted X-rays?

- a. lower energy X-rays are removed
- b. higher energy X-rays are removed
- c. only characteristic X-rays are removed
- d. no X-rays are removed

D

19) X-rays penetrating the housing are classified as what type of radiation?

- a. primary
- b. scattered
- c. Compton
- d. leakage

D

20) In order to prevent unwanted exposure, what practice is best?

- a. remove the battery when not in use
- b. never point the emission port at anyone not intended to receive X-rays
- c. remain in the backscatter zone during a radiographic procedure
- d. all of the above

C

21) A stochastic biological effect occurs

- a. if a threshold is exceeded
- b. with all exposures of X-ray radiation
- c. randomly
- d. only in children

**B**

22) Generally, children require less exposure time than adults because

- a. adults generally have more dental problems
- b. children have thinner tissues and smaller teeth
- c. tissue density is lower in children
- d. the child is more prone to movement

**C**

23) Which exposure factor can be changed by the operator on the MaxRay?

- a. tube potential
- b. tube current
- c. exposure time
- d. all of the above

**D**

24) Except for their energy level, X-rays are essentially the same as

- a. microwaves
- b. visible light
- c. radio waves
- d. all of the above

**A**

25) What is meant if an atom is "ionized"?

- a. it loses an electron
- b. its mass is doubled
- c. its nucleus shrinks
- d. all of the above