

# MaxRay Cocoon Handheld X-ray Systems Operator Training Exam

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

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

## Instructions

Read each question carefully and choose the best answer.

- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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

- \_\_\_\_\_ 5) If the operator has no options except to violate the backscatter protection zone, the operator should
- a. wear a lead apron
  - b. not take the image
  - c. get supervisory approval
  - d. proceed without concern
- \_\_\_\_\_ 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
- \_\_\_\_\_ 7) When not in use for an extended period of time, the Cocoon should be stored
- a. on the counter
  - b. in the exam room
  - c. in the breakroom
  - d. in a locked cabinet
- \_\_\_\_\_ 8) To maximize the backscatter protection 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
- \_\_\_\_\_ 9) Prior to taking an exposure, the operator should ensure that
- a. they are within the backscatter protection zone
  - b. the patient is properly shielded
  - c. all unnecessary persons are out of the room
  - d. all of the above
- \_\_\_\_\_ 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

- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
- \_\_\_\_\_ 16) X-rays are best shielded by
- a. low density material
  - b. high density material
  - c. human tissue
  - d. scatter material

- \_\_\_\_\_ 17) The majority of X-rays in a 70 kV primary X-ray beam are produced by which mechanism?
- a. Compton scatter
  - b. characteristic X-rays
  - c. Bremsstrahlung
  - d. none of the above
- \_\_\_\_\_ 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
- \_\_\_\_\_ 19) X-rays penetrating the housing are classified as what type of radiation?
- a. primary
  - b. scattered
  - c. Compton
  - d. leakage
- \_\_\_\_\_ 20) In order to prevent unwanted exposure, what practice is best?
- a. lock the unit in a cabinet when not in use
  - b. never point the emission port at anyone not intended to receive X-rays
  - c. remain in the backscatter protection zone during a radiographic procedure
  - d. all of the above
- \_\_\_\_\_ 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

- \_\_\_\_\_ 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
- \_\_\_\_\_ 23) Which exposure factor can be changed by the operator on the Cocoon?
- a. filament current
  - b. tube current
  - c. exposure time
  - d. tube potential
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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