Radiographic Image Analysis 6th edition Martensen Test Bank

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Test Bank - Chapter 01

Q1: The patient demographic requirements for radiographic images include all of the following except:

A. Patient and facility identification
B. Time and date
C. Birth date
D. Technologist's identification (Correct)

Q2: Which of the following is true about image markers? 1. They are radiopaque. 2. They should be reversed before being placed on the IR. 3. They should be positioned as close to the median plane as possible. 4. They will be magnified if positioned on the imaging table or patient.

A. 1 only
B. 1 and 4 only (Correct)
C. 2 and 3 only
D. 4 only

Q3: What is the marker placement for the projection of lateral vertebrae?

A. Laterally on the side being identified
B. Anteriorly, identifying the side positioned closer to the IR (Correct)
C. Anywhere within exposure field
D. Laterally, identifying the side situated closer to the IR

Q4: What is the marker placement for the projection of PA cranium?

A. Laterally on the side being identified (Correct)
B. Anteriorly, identifying the side positioned closer to the IR
C. Anywhere within the exposure field
D. Laterally, identifying the side situated closer to the IR

Q5: What is the marker placement for the projection of PA oblique vertebrae?

A. Laterally on the side being identified
B. Anteriorly, identifying the side positioned closer to the IR
C. Anywhere within the exposure field
D. Laterally, identifying the side situated closer to the IR (Correct)

Q6: What is the marker placement of the projection of lateral hand?

A. Laterally on the side being identified
B. Anteriorly, identifying the side positioned closer to the IR
C. Anywhere within the exposure field (Correct)
D. Laterally, identifying the side situated closer to the IR

Q7: Which guideline should be used to position the identification (ID) plate?

A. Place the ID plate within the collimated field whenever possible.
B. Position the ID plate toward the direction in which the central ray was angled.
C. Position the ID plate next to the narrowest anatomic structure. (Correct)

Q8: Elongation occurs in all of the following situations except when the

A. part is off-center.
B. central ray is angled with the part.
C. central ray and part are perpendicular but the IR is angled.
D. central ray and IR are perpendicular and the part is angled. (Correct)

Q9: For an open joint space to be obtained, the central ray must be aligned _____ to the joint.

A. perpendicular
B. parallel (Correct)
C. 5 degrees cephalic for each 4 inches of tissue thickness
D. 5 degrees caudal for each 4 inches of tissue thickness

Q10: When the central ray is angled, the structure situated _____ is projected the most.

A. farther away from the IR (Correct)
B. closer to the IR
C. proximal to the tube
D. distal to the tube

Q11: Three images were obtained on the same structure with a computed radiography system. Image 1 was obtained using a 48-inch source–image receptor distance (SID) and a 5-inch object–image receptor distance (OID); image 2 was obtained using a 48-inch SID and a 3-inch OID; and image 3 was obtained with a 48-inch SID, a 3-inch OID, and a larger IR. Which image will demonstrate the sharpest recorded detail?

A. Image 1
B. Image 2 (Correct)
C. Image 3
D. There will be no difference in recorded detail.

Q12: Three images were obtained on the same structure with a computed radiography system. Image 1 was obtained using a 48-inch source–image receptor distance (SID) and a 5-inch object–image receptor distance (OID); image 2 was obtained using a 48-inch SID and a 3-inch OID; and image 3 was obtained with a 48-inch SID, a 3-inch OID, and a larger IR. Which image will demonstrate the greatest size distortion?

A. Image 1 (Correct)
B. Image 2
C. Image 3

D. There will be no difference in size distortion.

Q13: A small focal spot should be used for each of the following situations except when

A. fine detail demonstration is important.
B. extremities are imaged.
C. the milliamperage setting is above 300. (Correct)
D. the patient can control motion.

Q14: An image demonstrating motion and adequate density was obtained using 100 mA at 0.5 seconds. If the time is changed to 0.25 seconds, what mA should be used to maintain density?

A. 100 mA
B. 200 mA (Correct)
C. 300 mA
D. 400 mA

Q15: Anatomical relationships are affected by 1. varying degrees of patient obliquity and flexion. 2. off-centering. 3. geometrical factors of magnification, elongation, and foreshortening. 4. similar structures of shape and size.

A. 1 and 4 only
B. 1, 2, and 4 only
C. 1, 3, and 4 only
D. All are correct (Correct)

Q16: Good collimation practices result in which of the following? 1. Reduces histogram analysis errors 2. Clearly delineates the VOI 3. Improves the visibility of recorded details by reducing the amount of scatter radiation that reaches the IR 4. Decreases the radiation dosage by limiting the amount of scatter from the patient

A. 2 and 3 only
B. 1, 2, and 3 only (Correct)
C. 1, 2, and 4 only
D. 1, 2, 3, and 4

Q17: Minimizing size distortion is accomplished by which of the following? 1. Using the longest feasible SID 2. Using the shortest possible OID 3. Decreasing the angle of the CR 4. Placing the part as close to the IR as possible

A. 2 and 3 only
B. 1, 2, and 3 only
C. 1, 2, and 4 only (Correct)
D. 1, 2, 3, and 4

Q18: Collimation guidelines include all of the following except for 1. chest and abdomen projections, collimate to within 1 inch (2.5 cm) of the patient's skin line. 2. extremity projections, collimate to within 0.5 inch (1.25 cm) of the skin line of the thickest VOI. 3. chest and abdomen

projections, collimate to within 0.50 inch (1.25 cm) of the IR edge. 4. collimating structures within the torso, bring the collimated borders to within 1 inch (2.5 cm) of the VOI.

A. 1 and 3
B. 2 and 4 (Correct)
C. 3 only
D. 4 only

Q19: The medial and lateral femoral condyles are not superimposed on a lateral knee projection. The larger, lateral condyle is 1 inch (2.5 cm) anterior to the medial condyle. The best way to correct this error is to

A. rotate the medial condyle 1 inch (2.5 cm) anteriorly.
B. rotate the medial condyle 0.5 inch (1.25 cm) anteriorly. (Correct)
C. increase the CR angle to accommodate for the larger condyle.
D. increase the CR angle to magnify the smaller condyle.

Q20: When imaging long bones, which of the following is (are) correct statement(s)? 1. Choose a large enough IR so that one or both joints are included on the projection. 2. Extend the collimation field so it extends 1 to 2 inches (2.5 cm to 5 cm) beyond the joints spaces as required. 3. Histogram errors may occur if the system algorithm does not recognize a diagonal exposure field. 4. Align the long bone parallel to the IR to prevent a histogram analysis error.

A. 1 only
B. 4 only
C. 1, 2, and 4 only
D. 1, 2, 3, and 4 (Correct)

Q21: The greatest detail sharpness is obtained by using 1. a small focal spot. 2. the longest SID. 3. the smallest OID. 4. longer exposure times.

A. 1 only
B. 4 only
C. 1, 2, and 3 only (Correct)
D. 1, 2, 3, and 4

Q22: To correctly mark a crosstable lateral hip projection 1. place the marker anteriorly to prevent it from obscuring posterior structures. 2. place the marker to indicate the side closest to the IR. 3. place the marker toward the edge of the IR outside the exposure field. 4. include an arrow to indicate the side positioned away from the table or cart.

A. 1 and 2 only (Correct)
B. 1, 2, and 3 only
C. 1, 2, and 4 only
D. 1, 2, 3, and 4

Q23: The off-centered diverged beams of a perpendicular CR will affect structures in the same manner as an angled CR. Which of the following statements best describes this relationship? 1. At

a 40-inch SID, the divergence of x-rays is 1 degree for every inch off-centered in any direction from the CR. 2. At a 48-inch SID, beam divergence is off-centered about 2 degrees for every inch in any direction from the CR. 3. At a 40-inch SID, the divergence of x-rays is 2 degrees for every inch off-centered in any direction from the CR. 4. At a 72-inch SID, beam divergence is off-centered about 1 degree for every inch.

A. 1 and 2 only
B. 3 and 4 only (Correct)
C. 1 and 4 only
D. 2 and 4 only

Q24: When displaying images acquired on a direct–indirect-capture digital radiography system (DR), which of the following statements are true? 1. Patient orientation must be considered. 2. Diagonally obtained projections will be displayed vertically. 3. IR orientation must be considered. 4. The correct examination must be selected before exposing the IR.

A. 1 and 2 only
B. 2 and 4 only
C. 1, 2, and 4 only
D. 1, 3, and 4 only (Correct)

Q25: All of the following statements about display stations are true except: 1. If the digital system matrix size is smaller than the display station's matrix size, the values of surrounding pixels will be rounded up or down to display the whole projection. 2. To display images at full resolution, the display monitor must be able to display the same number of pixels as those at which the digital system acquired the image. 3. Display station resolution refers to the maximum number of pixels that the screen can demonstrate. 4. The technologist's workstation display monitors typically demonstrate resolution as high as that of the radiologist's display monitor.

A. 1 and 2 only
B. 2 and 4 only
C. 1, 2, and 3 only (Correct)
D. None are correct

Q26: To properly display extremity projections, display 1. finger, wrist, and forearm projections as if the patient were hanging from the fingertips. 2. elbow and humeral projections as if they were hanging from the patient's shoulder. 3. toe and AP and PA oblique foot projections as if the patient were hanging from the toes. 4. lateral foot, ankle, lower leg, knee, and femur projections as if they were hanging from the patient's hip.

A. 1 and 2 only
B. 2 and 4 only
C. 1, 2, and 3 only
D. 1, 2, 3, and 4 (Correct)

Q27: Placing a marker directly on the IR or imaging tabletop 1. avoids marker distortion and magnification. 2. prevents scatter radiation from undercutting the marker. 3. ensures the marker will not be projected off the IR. 4. attenuates most but not all of the incident x-rays.

A. 1 and 2 only

B. 2 and 4 only

C. 1, 2, and 3 only (Correct)

D. 1, 2, 3, and 4

Q28: A post-processing manipulation that can be added to digital projections as a means of helping the viewer to better evaluate contrast resolution in the selected area is a

A. collimation.

B. contrast mask. (Correct)

C. dimensional annotation.

D. projection mask.

Q29: All of the following statements with regard to an angled CR or divergent beams used to record an object are true except:

A. Angling the CR will not affect how the anatomical structures will appear on a projection. (Correct)

B. Objects positioned on the same plane but at different distances from the IR will be moved different amounts.

C. The more the CR is angled, the more the object will move.

D. The object will move in the direction in which the beams are traveling.

Q30: The most common shape distortion is

A. shape/size distortion.

B. magnification.

C. foreshortening.

D. elongation. (Correct)

Q31: The quality of spatial resolution of a digital imaging system is mainly defined by 1. the size of the matrix. 2. the size of the pixel within the matrix. 3. the spatial frequency. 4. line pairs per millimeter (lp/mm).

A. 1 and 2 only (Correct)

B. 2 only

C. 3 only

D. 4 only

Q32: Two structures are 4.5 inches apart and out of superimposition 2.5 inches. To bring them into superimposition, the CR should be angled _____ degrees.

A. 5

B. 10

C. 20 (Correct)

D. 25

Q33: To shield the female gonads properly, 1. use a flat contact shield made from at least 0.5 mm of lead. 2. use a flat contact shield cut to the shape of the inlet pelvis. 3. the dimensions of the shield used are determined by the OID and SID and by the size of the patient's pelvis. 4. the entire inlet pelvis should be shielded.

A. 1 only
B. 1 and 2 only
C. 2, 3, and 4 only (Correct)
D. 1, 2, 3, and 4

Q34: Gonadal shielding is recommended in which of the following situations? 1. When the gonads are within 2 inches (5 cm) of the primary x-ray beam 2. If the patient is of reproductive age 3. When the gonadal shield does not cover the VOI 4. When any radiosensitive cells are in the primary beam

A. 1 only
B. 1 and 2 only
C. 1, 2, and 3 only (Correct)
D. 1, 2, and 4 only

Q35: Effective radiation protection practices include all of the following except: 1. Effective communication and immobilization devices 2. Maintaining minimum source-skin distances (SSD) 3. Oscillating grids and contact shields 4. Collimation and minimizing technical factors

A. 1 only
B. 1 and 2 only
C. 1, 2, and 3 only
D. 1, 2, and 4 only (Correct)

Q36: The following statements with regard to the spatial resolution in a DR system are true except: 1. DR systems have spatial resolution capabilities of approximately 3.7 lp/mm. 2. Spatial resolution is affected by the size of the DELs and the spacing between them. 3. Changing the size of the exposure field (collimation) does not affect spatial resolution. 4. As the DELs become larger, the spatial resolution capability increases.

A. 1 only
B. 1 and 2 only
C. 1, 2, and 3 only (Correct)
D. 1, 2, and 4 only

Q37: Diagnostic imaging professionals have a responsibility to adhere to effective radiation protection practices for which of the following reasons? 1. The risk of cancer from radiologic examinations accumulates over a lifetime. 2. To limit the risk of stochastic effects to a reasonable level compared with nonradiation risks and in relation to society's needs, benefits gained, and economic factors. 3. Good patient care standards dictate the use of effective radiation protection practices. 4. Continually evaluating one's radiation protection practices is necessary because radiation protection guidelines for diagnostic radiology assume a linear, nonthreshold, dose–risk relationship.

A. 1 and 2 only
B. 1, 2, and 3 only
C. 1, 2, and 4 only
D. 1, 2, 3, and 4 (Correct)

Q38: A rotating collimator head 1. can be rotated without rotating the entire tube column on DR systems. 2. does not affect the alignment of the beam with the grid. 3. allows the technologist to increase collimation on projections when the longitudinal axis of the anatomical structure is not aligned with the longitudinal or transverse axis of the IR. 4. can cause overcollimation.

A. 1 and 2 only
B. 1, 2, and 3 only (Correct)
C. 1, 2, and 4 only
D. 1, 2, 3, and 4

Q39: Two structures are 2.5 inches apart and out of superimposition 1.5 inches. To bring them into superimposition, the CR should be angled _____ degrees.

A. 5
B. 10
C. 15 (Correct)
D. 20