
1001

Questions about Radiologic Technology Volume 1

By Roy Bell



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1001 QUESTIONS ABOUT RADIOLOGIC TECHNOLOGY

Volume 1

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1001 QUESTIONS ABOUT RADIOLOGIC TECHNOLOGY

Preface

The questions provided on the following pages are designed to assess the student's knowledge in those subject areas considered to be of importance in radiologic technology. The book has been especially developed for students who are preparing to take the radiography examination given by the American Registry of Radiologic Technologists. The question content is based largely on the "Content Specifications for the Examination in Radiography" issued by the American Registry in September, 1979. The book is not to be considered a substitute for basic study; nor are the questions intended to be a sample of those the student will encounter during the ARRT examination. Rather, they are intended to help the student discover weaknesses in specific subject areas. The student can then return to his textbooks for comprehensive study in those particular areas.

The questions are completely referenced in order to aid the student in a review of areas where knowledge is found to be less than optimum. The references are cited by number as they are listed at the back of the book; this number is followed by the first page number in the reference where the answer can be found. The student is urged to use these references in order to gain a thorough understanding of the subject matter.

*To all of my students,
past, present, and future,
and especially
to my first student,
my wife, Shirlee*

**1001 QUESTIONS ABOUT
RADIOLOGIC TECHNOLOGY**

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Section 1
Principles of
Radiographic
Exposure and
Processing

1. When selecting tube rating charts, which of the following must be considered?
 - A. The type of radiographic tube.
 - B. The focal spot of the specific tube in question.
 - C. The stator power.
 - D. The type of rectification system used with the generator.
 - E. All of these.2:21

2. The photographic properties of radiography determine the
 - A. Sharpness of image details.
 - B. Visibility of image details.
 - C. Degree of distortion of the image.
 - D. Definition of the image.
 - E. None of these.6:61

3. Adjustment of milliamperage controls the
 - A. Length of time that electrons are emitted from the cathode.
 - B. Quantity of x-rays produced.
 - C. Penetrating ability of the x-ray beam.
 - D. Energy of electrons in the cathode stream.
 - E. Wavelength of x-rays produced.6:58

4. A _____ KV change is necessary to produce a noticeable increase in film density at 40 KV.
 - A. 2.
 - B. 6.
 - C. 10.
 - D. 15.
 - E. 20.6:65

5. Radiographic definition is improved at
 - A. Maximum object film distance.
 - B. Minimum anode film distance.
 - C. Maximum focal film distance.
 - D. Minimum focal film distance.
 - E. None of these.17:107

6. Which of the following statements about the anode heel effect is incorrect?
 - A. The thickest part is placed at the cathode end of the x-ray tube.
 - B. The effect is more noticeable at reduced focal-film distances.
 - C. The effect is more noticeable with large film sizes.
 - D. The effect is imperceptible at increased focal-film distances.
 - E. The principle can be used effectively in skull examinations.6:72

7. The smallest distance between two recognizable images in a radiograph is called the
 - A. Resolution.
 - B. Latitude.
 - C. Gamma factor.
 - D. Density.
 - E. Magnification.5:13

8. Which of the following MA and time combinations will produce the greatest radiographic density?
 A. 100 MA, 1 second.
 B. 200 MA, 1/2 second.
 C. 400 MA, 1/4 second.
 D. 500 MA, 1/5 second.
 E. 1000 MA, 1/8 second. 6:59
9. Radiographic definition is affected by
 A. KVP.
 B. Focus-film distance.
 C. Object-film distance.
 D. All of these.
 E. More than one, but not all of these. 17:107
10. Which of the following is not essential for the standardization of film processing and maintenance of optimum film quality?
 A. Following the manufacturer's recommendations.
 B. Maintaining proper solution concentration.
 C. Maintaining strict time/temperature control.
 D. Performing scheduled maintenance as required.
 E. Installing a silver recovery unit. 6:71
11. Milliamperage and exposure time are _____ each other to maintain density.
 A. Not related to.
 B. Directly proportional to.
 C. Inversely proportional to.
 D. Independent of.
 E. None of these. 6:59
12. Excessive radiographic density may be due to
 A. Increased processing temperature.
 B. Increased processing time.
 C. Increased solution concentration.
 D. All of these.
 E. More than one, but not all of these. 6:71

For each word or phrase, select the one heading which is most closely related to it. Each heading may be used once, more than once, or not at all.

- | | |
|---|-------------------|
| 13. Quantity of radiation. | A. Definition. |
| 14. Difference between adjacent structures. | B. Density. |
| 15. Geometric sharpness. | C. Contrast. |
| 16. Misrepresentation. | D. Distortion. |
| 17. Density differences. | E. None of these. |
- 6:4

18. A balance must be achieved between _____ and _____ of the image in a quality radiograph.
A. Distortion, definition.
B. Definition, sharpness.
C. Sharpness, visibility.
D. Visibility, distortion.
E. Distortion, sharpness. 6:2
19. A light radiograph may be caused by
A. Underexposure.
B. Bucky cut-off.
C. Line voltage too low.
D. All of these.
E. More than one, but not all of these. 3:37
20. Which of the following would not be used for the front of a cassette?
A. Bakelite.
B. Magnelite.
C. Aluminum.
D. Plastic.
E. Lead. 3:18
21. Penetration of a part to be radiographed is primarily a function of the
A. MAS.
B. FFD.
C. KVP.
D. Exposure time.
E. None of these. 14:117
22. Of the following, which is a type of compensating filter?
A. Unilateral wedge.
B. Bilateral wedge.
C. Trough.
D. All of these.
E. None of these. 5:77
23. An increase in radiographic exposure is required when a patient has which of the following conditions?
A. Osteoporosis.
B. Emphysema.
C. Osgood-Schlatter's disease.
D. Paget's disease.
E. Diabetes. 3:161
24. If 30 MAS provides optimum density at a 36 inch FFD, _____ MAS would be necessary to attain the same density at a 72 inch FFD.
A. 7.5.
B. 15.
C. 60.
D. 120.
E. None of these. 6:63

25. Which of the following statements concerning radiographic density is correct?
A. It is probably the most important radiographic quality.
B. It is the one factor which must remain constant and optimum.
C. It is effected by multiple factors.
D. All of these.
E. More than one, but not all of these. 6:54
26. Which of the following would play a distinct part in tissue thickness and density?
A. The patient's physique.
B. The patient's age.
C. The type of pathological process.
D. All of these.
E. More than one, but not all of these. 6:55
27. The quantity of electrons in the cathode stream of the x-ray tube is determined by the
A. Kilovoltage.
B. Focal-film distance.
C. Focal spot size.
D. Object-film distance.
E. None of these. 6:58
28. The distance from the lead strips of a grid to a point where all of the lines will converge is the
A. Grid ratio.
B. Grid canting.
C. Grid amplitude.
D. Grid cut-off.
E. None of these. 17:120
29. Which of the following may cause poor film-screen contact?
A. A warped cassette front.
B. A wrinkled screen caused by moisture.
C. Foreign bodies under the screen, causing uneven pressure.
D. A cracked cassette frame.
E. All of these. 17:118
30. Which of the following was considered a disadvantage of intensifying screens in the early days of radiography?
A. Film graininess from large crystals.
B. Objectionable afterflow due to impurities.
C. Lack of crystal uniformity and manufacturing uniformity.
D. The absence of a protective coating which prohibited screen cleaning.
E. All of these. 17:116
31. Calcium tungstate is used in intensifying screens because
A. The spectral emission is blue-violet.
B. It responds well to the kilovoltage levels used in diagnostic radiography.
C. It is stable.
D. It can be manufactured with uniform quality.
E. All of these. 17:116

32. Knowledge of the geometric principles of radiography is essential to maintain which radiographic quality?
A. Density.
B. Definition.
C. Contrast.
D. All of these.
E. More than one, but not all of these. 6:7
33. Lack of good film/screen contact will result in an increased degree of _____ in the area exhibiting the poor contact.
A. Definition.
B. Unsharpness.
C. Density.
D. Detail.
E. Sharpness. 6:21
34. Definition of the radiographic image is always improved by a reduction in the
A. Focal-film distance.
B. Focal spot size.
C. Developing time.
D. Amount of silver in the film emulsion.
E. Focus-object distance. 6:25
35. Which of the following may be used to control motion during a radiographic examination?
A. Proper explanation of the procedure.
B. Short exposure time.
C. Proper immobilization.
D. All of these.
E. More than one, but not all of these. 6:8
36. For the control of motion, which of the following MA-time combinations would be most effective?
A. 100 MA, 1 second.
B. 200 MA, 1/2 second.
C. 400 MA, 1/4 second.
D. 500 MA, 1/5 second.
E. Since all of these combinations produce the same MAS, one is no more effective than another in the control of motion. 6:9
37. The unsharpness of the outer edge of the radiographic image is called
A. Graininess.
B. Mottle.
C. Umbra.
D. Penumbra.
E. Canting. 6:23

38. The factors which govern geometric unsharpness include
A. Effective focus size.
B. Focal-film distance.
C. Object-film distance.
D. All of these.
E. More than one, but not all of these. 6:23
39. Which of the following statements concerning a 16:1 ratio linear grid is correct?
A. It has very high cleanup.
B. It has little, or no, positioning latitude.
C. It is intended primarily for use above 100 KVP.
D. All of these.
E. More than one, but not all of these. 17:123
40. When converting from a 6:1 grid to a 16:1 grid, density may be maintained by _____ the MAS.
A. Doubling.
B. Tripling.
C. Quadrupling.
D. Halving.
E. None of these. 17:121
41. To measure the effective focal spot size, one would use a
A. Pinhole camera.
B. Wire mesh test.
C. Penetrometer.
D. Paper clip test.
E. Star pattern test. 2:155
42. The characteristic curve describes the relationship between
A. Contrast and density.
B. Detail and density.
C. Optical density and radiation intensity.
D. Film latitude and resultant contrast.
E. None of these. 2:117
43. The radiographic quality that makes the visibility of the different body structures possible is
A. Definition.
B. Density.
C. Contrast.
D. Sharpness.
E. None of these. 6:88
44. Of the following, the incorrect statement is
A. 100 MA at 1/2 sec. = 50 MAS.
B. 200 MA at 3/10 sec. = 60 MAS.
C. 200 MA at 2/5 sec. = 6.66 MAS.
D. 50 MA at 1/20 sec. = 2.5 MAS.
E. 50 MA at 1/2 sec. = 25 MAS. 3:134

45. The sharpness with which a radiographic image is recorded is the
A. Delineation.
B. Tone.
C. Contrast.
D. Definition.
E. Distortion. 17:107
46. On full-wave rectified equipment, if one selected the factors of 300 MA and 3 impulses, what would the MAS be?
A. 2.5.
B. 5.
C. 7.5.
D. 9.
E. 10. 3:102
47. When elimination of motion is absolutely essential for a radiographic examination, the best factor adjustment to make is
A. Decrease the focal-film distance.
B. Use faster intensifying screens.
C. Decrease exposure time.
D. Increase the MAS.
E. Use non-screen exposure. 6:9
48. Which of the following would afford the most latitude for a radiographic exposure?
A. Non-screen exposure.
B. Slow speed screens.
C. Par speed screens.
D. High speed screens.
E. Latitude is not effected by the choice of screens. 6:15
49. In analyzing the effect of materials on radiographic definition, _____ may generally be disregarded as a factor.
A. Screen speed.
B. Screen-film contact.
C. Film.
D. Screen crystal size.
E. Thickness of the crystal layer. 6:16
50. When both screen and non-screen film are used with non-screen holders, non-screen film is approximately _____ times faster than screen film.
A. 4.
B. 10.
C. 15.
D. 20.
E. 24. 6:14
51. Which of the following has the greatest intrinsic unsharpness factor?
A. Non-screen holder.
B. Slow speed screens.
C. Par speed screens.
D. High speed screens.
E. Intrinsic unsharpness does not depend on screen speed. 6:18