

**SECTION 2 CE QUESTIONS**  
**EPISODES 11 - 17**

1. Which of the following reconstruction algorithms is an important image processing tool that decomposes an image into components?
  - a. Iterative reconstruction
  - b. An algorithm
  - c. Interpolation
  - d. Fourier transform

Ans. D

Ref. Episode 11, Slide 5

2. Which of the following best describes the place in the computer where the operating system, application programs and data in current use are kept?
  - a. ROM
  - b. WORM
  - c. RAM
  - d. DVD-R

Ans. C

Ref. Episode 11, Slide 12

3. The process of using raw data to create an image is most likely the description for which of the following?
  - a. Image reconstruction
  - b. Ray sum calculation
  - c. Iterative reconstruction
  - d. Windowing

Ans. A

Ref. Episode 11, Slide 14

4. The application of a filter function to an attenuation profile best describes which of the following?
  - a. Prospective reconstruction
  - b. Iterative reconstruction
  - c. Fourier transform
  - d. Convolution

Ans. D

Ref. Episode 11, Slide 19

5. "Repetitious" is the key to which of the following reconstruction algorithms?
  - a. Fourier transform
  - b. Iterative reconstruction

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- c. Filtered back projection
- d. Interpolation

Ans. B

Ref. Episode 11, Slide 23

6. With regard to Scan Field of View (SFOV) which of the following statements is true?
- 1. SFOV selection determines the number of detector cells collecting data
  - 2. SFOV is within the isocenter of the gantry
  - 3. Selecting SFOV determines the area from which raw data are acquired
  - 4. RT's should always select the SFOV that comes closest to encompassing the patient
  - 5. Parts of the patient located outside the SFOV may cause out-of-field artifact
- a. 1 through 5
  - b. 1, 3, 5
  - c. 2,3,4,5
  - d. 1, 2, 3, 5

Ans. A

Ref. Episode 11, Slide 24

7. Within which of the following CT Imaging Chain components are electrical impulses changed to binary data?
- a. The detector system
  - b. The ADC
  - c. The CT Computer
  - d. The DAC

Ans. B

Ref. Episode 11, Slide 52

8. Which of the following is a theory that describes the necessity of having more than one sample to correctly visualize a structure?
- a. Iterative
  - b. Fourier
  - c. Nyquist
  - d. Filtered back projection

Ans. C

Ref. Episode 11, Slide 57

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9. Which of the following are assigned to directly correspond to the shades of grey on the HU scale during the reconstruction process?
- a. Nyquist samples
  - b. K space details
  - c. CT numbers
  - d. Mew values

Ans. C

Ref. Episode 11, Slide 59

10. With regard to matrix size and image quality, which of the following statements is true?
1. The larger the matrix, the better the image quality
  2. As matrix size decreases, pixel size increases
  3. Pixel size = matrix size / FOV
  4. As matrix size increases, computer memory capacity must increase
- a. 1 through 4
  - b. 1, 2, 3
  - c. 2, 3, 4
  - d. 1, 2, 4

Ans. D

Ref. Episode 11, Slide 61 & 63\*

11. Which of the following is an advantage of single breath hold acquisitions?
1. Exam acquisition times are maximized
  2. Lesion shifting is minimized/eliminated
  3. MPR & 3D reconstruction data quality is maximized\*
- a. 1 through 3
  - b. 1, 2
  - c. 2, 3
  - d. 2

Ans. C

Ref. Episode 11, Slide 75

12. Which of the following is used to prescribe the location of cross-sectional slices?
- a. The localizer scan
  - b. Angular modulation
  - c. Longitudinal modulation
  - d. Zero axis localization

Ans. A

Ref. Episode 12, Slide 6

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13. Which of the following technologies is specifically characterized as volumetric?\*
- a. Localizer scanning
  - b. Axial scanning
  - c. Helical scanning
  - d. Dynamic scanning

Ans. C

Ref. Episode 12, Slide 34\*

14. Scan parameters for a particular protocol include 200 mA, 8 sec. scan time, 100 kVp, 1.2 PITCH, 2.5 mm slice thickness, 28 cm SFOV, 1024 matrix with 30 slices programmed and incrementation rate is 2 cm per sec. Calculate the anatomy covered.
- a. 750 mm
  - b. 7.5 cm
  - c. 20 cm
  - d. 20 mm

Ans. B (2.5 mm x 30 slices = 75 mm = 7.5 cm)

Ref. Episode 12, Slide 29

15. Which of the following technologies results in the production of axial slices in which the beginning and end points are not within in the same Z axis plane?
- a. Localizer scanning
  - b. Axial scanning
  - c. Helical scanning
  - d. Dynamic scanning

Ans. C

Ref. Episode 12, Slide 36

16. With regard to interpolation, which of the following statements is true?
- 1. As interpolation increases, image resolution decreases
  - 2. Interpolation is a complex statistical method resulting in images that closely resemble those acquired with axial mode
  - 3. Interpolation makes it possible to "take the slant out of the slice"
  - 4. As slice angle decreases, interpolation required decreases
  - 5. Interpolation not required when in axial mode
- a. 1 through 5
  - b. 1, 2, 3, 5
  - c. 1, 4, 5
  - d. 2, 3

Ans. A

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Ref. Episode 12, Slide 38, 39

17. Relative to PITCH, which of the following is a controlling factor?
1. The velocity of the indexing table
  2. The velocity of the tube within the gantry
  3. The beam width at the detectors
- a. 1 through 3  
b. 3  
c. 1, 2  
d. 2, 3

Ans. A

Ref. Episode 12, Slide 40

18. In order to calculate PITCH, which of the following equations would accurately apply?
- a.  $P = \text{FOV} / \text{Matrix}$
  - b.  $P = \text{table movement} \times \text{beam width}$
  - c.  $P = \text{beam width} / \text{table movement}$
  - d.  $P = \text{table movement} / \text{beam width}$

Ans. D

Ref. Episode 12, Slide 40

19. Which of the following best describes a type of Tube Current Modulation as existing “along the Z axis?”
- a. Angular
  - b. Longitudinal
  - c. ECG based\*
  - d. Organ based

Ans. B

Ref. Episode 14, Slide 10

20. Cross-plane spatial resolution particularly involves only which of the following planes?
- a. X
  - b. Y
  - c. Z
  - d. X & Y

Ans. C

Ref. Episode 14, Slide 16

FOR QUESTIONS 21 – 26 PLEASE USE A FOR TRUE AND B FOR FALSE and the following statement:

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WITH REGARD TO SPATIAL RESOLUTION (SR)...

21. ...As matrix size increases, SR increases  
a. True                      b. false                      (Ans. A, Ref. Episode 14, Slide 17)
22. ...As pixel size decreases, SR increases  
a. True                      b. false                      (Ans. A, Ref. Episode 14, Slide 17)
23. ...As PITCH increases, SR increases  
a. True                      b. false                      (Ans. B, Ref. Episode 14, Slide 19)
24. ...As patient motion increases, SR decreases  
a. True                      b. false                      (Ans. A, Ref. Episode 14, Slide 19)
25. ...As slice thickness decreases, SR increases  
a. True                      b. false                      (Ans. A, Ref. Episode 14, Slide 18)
26. ...As focal spot size increases, SR increases  
a. True                      b. false                      (Ans. B, Ref. Episode 14, Slide 18)

FOR QUESTIONS 27 – 29 PLEASE USE A FOR TRUE AND B FOR FALSE and the following statement:

WITH REGARD TO CONTRAST RESOLUTION (CR)...

27. ...As slice thickness decreases, CR increases  
a. True                      b. false                      (Ans. B, Ref. Episode 14, Slide 24)
28. ...As patient size increases, CR decreases  
a. True                      b. false                      (Ans. A, Ref. Episode 14, Slide 24)
29. ...As pixel size decreases, CR increases  
a. True                      b. false                      (Ans. B, Ref. Episode 14, Slide 23)

30. Which of the following is a Quality Assurance test that compares attenuated exposure with CT number accuracy?  
a. Linearity  
b. Low contrast detectability  
c. Sensitivity  
d. Contrast resolution

Ans. A, Ref. Episode 14, Slide 45

31. Maintaining patient confidentiality is the RT's primary concern when dealing with patient HIPAA compliance.  
a. True                      b. false                      (Ans. A, Ref. Episode 15, Slide 18)\*
32. The unlawful touching of a person without consent is the definition for which of the following?  
a. Assault  
b. Battery  
c. False Imprisonment  
d. Negligence

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Ans. B

Ref. Episode 15, Slide 30

33. \_\_\_\_\_ Pediatric blood pressure rate. (Ans. A; Ref. Episode 15, Slide 39)
- a. Blood pressure = 120/80
  - b. Respirations = 15-25/Minute
  - c. Pulse rate = 65 – 85 beats per minute
  - d. None of these

34. \_\_\_\_\_ Adult pulse rate. (Ans. C; Ref. Episode 15, Slide 39)
- a. Blood pressure = 120/80
  - b. Respirations = 15-25/Minute
  - c. Pulse rate = 65 – 85 beats per minute
  - d. None of these

35. \_\_\_\_\_ Pediatric Respiration rate (Ans. B; Ref. Episode 15, Slide 39)
- a. Blood pressure = 120/80
  - b. Respirations = 15-25/Minute
  - c. Pulse rate = 65 – 85 beats per minute
  - d. None of these

36. \_\_\_\_\_ Pediatric blood pressure rate (Ans. A; Ref. Episode 15, Slide 39)
- a. Blood pressure = 120/80
  - b. Respirations = 15-25/Minute
  - c. Pulse rate = 65 – 85 beats per minute
  - d. None of these

37. \_\_\_\_\_ Adult Respiration rate (Ans. D; Ref. Episode 15, Slide 39)
- a. Blood pressure = 120/80
  - b. Respirations = 15-25/Minute
  - c. Pulse rate = 65 – 85 beats per minute
  - d. None of these

38. "Less than 60 BPM" is most likely the definition for which of the following?
- a. Tachycardia
  - b. Bradycardia
  - c. Normal sinus rhythm
  - d. Normal adult pulse rate

Ans. B

Ref. Episode 15, Slide 45

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39. Which of the following is a test to measure the oxygen saturation of the blood?
- a. Oxygen saturation
  - b. Pulse rate evaluation
  - c. Oxygenation percentage
  - d. Pulse oximetry

Ans. D

Ref. Episode 15, Slide 47

40. With which of the following is an abnormal finding an indicator for Pulmonary Embolism?
- a. PTT
  - b. D-dimer
  - c. PT
  - d. LFT

Ans. B

Ref. Episode 15, Slide 52

41. \_\_\_\_\_ Injection through one or more layers of skin. (Ans. E; Ref. Episode 16, Slide 5)
- a. Osmosis
  - b. Viscosity
  - c. Clearance
  - d. Ionicity
  - e. Parenteral
42. \_\_\_\_\_ Normal half-life approximates 24 hours. (Ans. C; Ref. Episode 16, Slide 13)
- a. Osmosis
  - b. Viscosity
  - c. Clearance
  - d. Ionicity
  - e. Parenteral
43. \_\_\_\_\_ Determines degree of disassociation. (Ans. D; Ref. Episode 16, Slide 12)
- a. Osmosis
  - b. Viscosity
  - c. Clearance
  - d. Ionicity
  - e. Parenteral
44. \_\_\_\_\_ The friction of a fluid as it flows. (Ans. B; Ref. Episode 16, Slide 11)
- a. Osmosis
  - b. Viscosity
  - c. Clearance

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- d. Ionicity
  - e. Parenteral
45. \_\_\_\_\_ Fluid movement across permeable membrane. (Ans. A; Ref. Episode 16, Slide 10)
- a. Osmosis
  - b. Viscosity
  - c. Clearance
  - d. Ionicity
  - e. Parenteral
46. Which of the following may normally require as long as 40 minutes to enhance with IV contrast media?
- a. The liver
  - b. The spleen
  - c. The kidneys
  - d. The brain

Ans. D

Ref. Episode 16, Slide 31

47. Which of the following best describes isosmolar IV contrast media?
- a. The same osmolality as blood
  - b. Twice the osmolality of blood
  - c. Seven times the osmolality of blood
  - d. Less than the osmolality of blood

Ans. A

Ref. Episode 16, Slide 33

48. Which of the following is a low osmolality contrast media that possesses twice the osmolality of blood?
- a. Visipaque
  - b. Iodixanol
  - c. Renografin 76
  - d. Hexabrix

Ans. D

Ref. Episode 16, Slide 26

49. Which of the following is the formula used to calculate pediatric IV contrast dose?
- a. 2 mL / pound
  - b. 1 mL / kg

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- c. 1 mL / pound
- d. 2 mL / kg

Ans. D

Ref. Episode 16, Slide 37

50. With regard to lactation and IV contrast media, which of the following statements is true?
1. A very small percentage of IV contrast will be excreted into breast milk
  2. It is safe for breast feeding to continue immediately post IV contrast
  3. Wait 24 hours prior to resuming breast feeding post-IV contrast
- a. 1 through 3
  - b. 3
  - c. 1, 2
  - d. 1, 3

Ans. C

Ref. Episode 16, Slide 39

51. Which of the following type of adverse reaction to IV contrast is indicated when flu-like symptoms are the patient complaint?
- a. Anaphylaxis
  - b. Dose dependent
  - c. Anaphylactoid
  - d. Delayed

Ans. D

Ref. Episode 16, Slide 46

52. Which of the following is a method of preventing contrast induced renal insufficiency?
1. Use the smallest volume of IV contrast possible
  2. Discontinue all nephrotoxic medications prior to IV contrast
  3. Allow 2 – 5 days between IV contrast injections & procedures
- a. 1 through 3
  - b. 1, 3
  - c. 2, 3
  - d. 3

Ans. A

Ref. Episode 16, Slide 48

53. True allergic reactions result in the production of antibodies which are not found after IV contrast injections.
- a. True
  - b. false

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Ans. A

Ref. Episode 16, Slide 53

54. With regard to idiosyncratic reactions to IV contrast which of the following is a significant risk factor?

1. Asthma
  2. Previous reaction to IV contrast
  3. Seafood allergy
  4. An allergic history to foods, drugs or other substances
- a. 1 through 4
  - b. 3
  - c. 4
  - d. 1, 2, 4

Ans. D

Ref. Episode 16, Slide 56

55. For patients identified as being at increased risk of adverse reactions to IV contrast which of the following is a preventive measure?

1. Pretreat the patient with certain approved steroids
  2. Perform the procedure without IV contrast
  3. Hydrate the patient
  4. Use low osmolality IV contrast
- a. 1 through 4
  - b. 1, 2, 4
  - c. 1, 3
  - d. 2

Ans. A

Ref. Episode 16, Slide 57

56. Which of the following accurately describes the manner in which IV contrast impacts the function of the thyroid?

1. There is no effect when thyroid function is normal
  2. Hypothyroidism evokes an insignificant effect
  3. Thyroid storm may be precipitated when IV contrast is injected in the event of hyperthyroidism
- a. 1 through 3
  - b. 3
  - c. 1, 2
  - d. 1, 3

Ans. A

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Ref. Episode 16, Slide 69

57. Which of the following will significantly reduce the pulmonary effects potentially caused when the utilization of IV contrast is indicated?
- a. Hydrate the patient
  - b. Premedicate with certain steroids
  - c. Use low osmolality IV contrast
  - d. Screen for nitrates

Ans. C

Ref. Episode 16, Slide 70

58. Which of the following is a characteristic of water as a contrast media?
1. Water transits slowly
  2. Water distends the bowel completely
  3. Water does not obscure mucosal surfaces
  4. Water is sometimes used to replace negative contrast agents
- a. 1 through 4
  - b. 1, 2, 4
  - c. 3
  - d. 3, 4

Ans. C

Ref. Episode 16, Slide 81

59. Which of the following is a contraindication to the use of barium?
- a. Contrast allergy
  - b. Bowel perforation
  - c. Volvulus
  - d. Mueller maneuver

Ans. B

Ref. Episode 16, Slide 77

60. "To be administered by injection" is the definition for which of the following?
- a. Enteral
  - b. Intradermal
  - c. Intra-atrial
  - d. Parenteral

Ans. D

Ref. Episode 17, Slide 4\*

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FOR QUESTIONS 61 – 65, MATCH COLUMNS A & B. Answers may be used once, more than once, or not at all.

**COLUMN A**

- a. Injection through the skin, subcutaneous tissue & into the muscle
- b. An injection into an artery
- c. An injection into the upper layers of the skin
- d. Injection below the skin layers but above the muscle
- e. Direct injection into a vein

**COLUMN B**

61. \_\_\_\_\_ Intradermal (Ans. C; Ref. Episode 17, Slide 4)

- a. Injection through the skin, subcutaneous tissue & into the muscle
- b. An injection into an artery
- c. An injection into the upper layers of the skin
- d. Injection below the skin layers but above the muscle
- e. Direct injection into a vein

62. \_\_\_\_\_ Intravenous (Ans. E; Ref. Episode 17, Slide 4)

- a. Injection through the skin, subcutaneous tissue & into the muscle
- b. An injection into an artery
- c. An injection into the upper layers of the skin
- d. Injection below the skin layers but above the muscle
- e. Direct injection into a vein

63. \_\_\_\_\_ Intramuscular (Ans. A; Ref. Episode 17, Slide 4)

- a. Injection through the skin, subcutaneous tissue & into the muscle
- b. An injection into an artery
- c. An injection into the upper layers of the skin
- d. Injection below the skin layers but above the muscle
- e. Direct injection into a vein

64. \_\_\_\_\_ Intra-arterial (Ans. B; Ref. Episode 17, Slide 4)

- a. Injection through the skin, subcutaneous tissue & into the muscle
- b. An injection into an artery
- c. An injection into the upper layers of the skin
- d. Injection below the skin layers but above the muscle
- e. Direct injection into a vein

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65. \_\_\_\_\_ Subcutaneous (Ans. D; Ref. Episode 17, Slide 4)

- a. Injection through the skin, subcutaneous tissue & into the muscle
- b. An injection into an artery
- c. An injection into the upper layers of the skin
- d. Injection below the skin layers but above the muscle
- e. Direct injection into a vein

66. Within which of the following is a central venous access device placed to deliver medications and fluids?

- 1. SVC
- 2. Aorta
- 3. IVC
- 4. Left atrium
- 5. Right atrium

a. 1 through 5

b. 2, 4

c. 1, 3, 5

d. 4, 5

Ans. C

Ref. Episode 17, Slide 13

67. Never use a central venous device designed for dialysis for IV contrast injection.

- a. True
- b. false

Ans. A

Ref. Episode 17, Slide 16

68. Which of the following patient characteristics is most influential regarding the injection of IV contrast and the timing of vascular enhancement?

- a. Blood pressure
- b. Heart rate
- c. Oxygen saturation
- d. Cardiac output

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Ans. D

Ref. Episode 17, Slide 21

69. The most common acute problem associated with IV contrast injection is most likely which of the following?

- a. Phlebitis
- b. Extravasation
- c. Air embolism
- d. Inflammation

Ans. B

Ref. Episode 17, Slide 18

70. \_\_\_\_\_ As cardiac output decreases, the time to peak vascular enhancement increases. (Ans. A; Ref. Episode 17, Slide 60)

- a. true
- b. false

71. \_\_\_\_\_ As patient body weight increases, the magnitude of IV contrast enhancement increases. (Ans. B; Ref. Episode 17, Slide 59)

- a. true
- b. false

72. \_\_\_\_\_ As the flow rate of IV contrast increases, the time to peak aortic enhancement decreases. (Ans. A; Ref. Episode 17, Slide 58)

- a. true
- b. false

FOR QUESTIONS 73 – 78, MATCH COLUMNS A & B. Answers can be used once, more than once or not at all.

COLUMN A

- a. BOLUS PHASE
- b. NONEQUILIBRIUM PHASE
- c. EQUILIBRIUM PHASE
- d. NONENHANCED PHASE

COLUMN B

73. \_\_\_\_\_ Portal Venous Phase (Ans. B; Ref. Episode 17, Slide 53)

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- a. BOLUS PHASE
- b. NONEQUILIBRIUM PHASE
- c. EQUILIBRIUM PHASE
- d. NONENHANCED PHASE

74. \_\_\_\_\_ Arteriovenous iodine differential (AVID) is less than 10 (Ans. C; Ref. Episode 17, Slide 54)

- a. BOLUS PHASE
- b. NONEQUILIBRIUM PHASE
- c. EQUILIBRIUM PHASE
- d. NONENHANCED PHASE

75. \_\_\_\_\_ AVID is 30 or more (Ans. A; Ref. Episode 17, Slide 52)

- a. BOLUS PHASE
- b. NONEQUILIBRIUM PHASE
- c. EQUILIBRIUM PHASE
- d. NONENHANCED PHASE

76. \_\_\_\_\_ IV contrast is mostly emptied from the arteries, greatly diluted in the veins and has soaked the organ parenchyma (Ans. C; Ref. Episode 17, Slide 54)

- a. BOLUS PHASE
- b. NONEQUILIBRIUM PHASE
- c. EQUILIBRIUM PHASE
- d. NONENHANCED PHASE

77. \_\_\_\_\_ Arterial Phase (Ans. A; Ref. Episode 17, Slide 52)

- a. BOLUS PHASE
- b. NONEQUILIBRIUM PHASE
- c. EQUILIBRIUM PHASE
- d. NONENHANCED PHASE

78. \_\_\_\_\_ IV contrast distribution includes the arteries and veins (Ans. B; Ref. Episode 17, Slide 53)

- A. BOLUS PHASE
- B. NONEQUILIBRIUM PHASE
- C. EQUILIBRIUM PHASE

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D. NONENHANCED PHASE

79. In order, through which heart chambers would an IV contrast bolus injected into a vein in the antecubital space of the right arm travel?

- a. RA, RV, LA, LV
- b. LA, LV, RA, RV
- c. RV, RA, LV, LA
- d. RA, LA, RV, LV

Ans. A

Ref. Episode 17, Slide 31, 32

80. With regard to the injection of IV contrast for routine brain studies, injection rate is not important.

- a. true
- b. false

Ans. A

Ref. Episode 17, Slide 34

The Tuffest Stuff CT Registry Review