

SECTION 04 CE EXAM  
EPISODES 23 – 28

1. Which of the following controls the systemic circulation?
  - a. The right and left ventricles
  - b. The right and left atria
  - c. The left atrium and ventricle
  - d. The right atrium and ventricle

Ans. C

Ref. Episode 23, Slide 3

2. As associated with the mediastinum, which of the following is NOT a great vessel?
  1. The aorta
  2. The SVC
  3. The IVC
  4. The Pulmonary Trunk
  5. The celiac axis
  6. The Pulmonary Veins
  - a. 4, 6
  - b. 5
  - c. 1, 2, 3
  - d. 3, 4, 5

Ans. B

Ref. Episode 23, Slide 4

3. Which of the following accurately describes systole?
  1. The heart contracts
  2. Approximately 70 cc's is ejected from each of the adult ventricles
  3. It is the bottom number regarding blood pressure measurements
  4. Atrioventricular valves are open
  5. Semilunar valves are closed
  - a. 1, 3, 5
  - b. 2, 4
  - c. 3, 4, 5
  - d. 1, 2

Ans. D

Ref. Episode 23, Slide 7

4. Which part of the cardiac cycle is demonstrated when blood from the atria fills the ventricles?
  - a. Systole
  - b. Diastole
  - c. Cardiac inversion
  - d. Arrhythmia

Ans. B

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Ref. Episode 23, Slide 7

5. With regard to the electrocardiogram, which of the following is an indication of ventricular repolarization?
- The QRS complex
  - The T wave
  - The P wave
  - The ST Segment

Ans. B

Ref. Episode 23, Slide 10

6. The heart sound “Dub” is most likely an indication of which of the following?
- Closure of the Atrioventricular valves
  - Full on systole
  - Closure of the Semilunar valves
  - Atrial fibrillation

Ans. C

Ref. Episode 23, Slide 13

7. A resting heart rate of 100 beats per minute or higher is an indication of which of the following?
- Tachycardia
  - Bradycardia
  - Normal sinus rhythm
  - A normal pediatric heart

Ans. A

Ref. Episode 23, Slide 17

8. With regard to the heart, which of the following statements is accurate?
- The right ventricle is the most posterior chamber
  - The base is the broad, superior portion
  - The heart lies at a 45 degree angle within the thorax
  - The adult male heart weighs approximately 10.5 ounces
  - The heart apex projects anteriorly and to the left of midline
- 1 thru 5
  - 1, 3, 5
  - 1 only
  - 2, 3, 4, 5

Ans. D

Ref. Episode 23, Slides 20, 22, 24, 25

9. Which of the following is a primary function of the pericardial sac?

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1. Provides barrier protection from infection
  2. Fixes the heart position within the mediastinum
  3. Prevents excessive dilatation of the heart
  4. Encloses the heart and proximal great vessels
  5. Makes it possible for lubrication during the cardiac cycle to happen
- a. 1 thru 5
  - b. 2, 3, 4
  - c. 1, 5
  - d. 1, 2, 4

Ans. A

Ref. Episode 23, Slide 26

10. Which of the following is the thin, inner lining of the heart chambers?
- a. Pericardium
  - b. Myocardium
  - c. Endocardium
  - d. None of the above

Ans. C

Ref. Episode 23, Slide 28

11. Which of the following is located between the right ventricle and the main pulmonary artery?
- a. The mitral valve
  - b. The tricuspid valve
  - c. The bicuspid valve
  - d. The pulmonic valve

Ans. D

Ref. Episode 23, Slide 32

12. Which of the following prevents regurgitation into the left ventricle?
- a. Mitral valve
  - b. Aortic valve
  - c. Pulmonic valve
  - d. Tricuspid valve

Ans. B

Ref. Episode 23, Slide 35

13. With regard to imaging of the coronary arteries, which of the following statements is true?
1. The coronaries normally measure 2 – 4 mm in diameter
  2. The coronaries constantly move during the cardiac cycle
  3. The coronary arteries fill during systole

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4. An increase in detector rows will increase temporal resolution
  5. A decrease in detector size will increase spatial resolution
- a. 1 thru 5
  - b. 1, 4
  - c. 2, 5
  - d. All except 3

Ans. D

Ref. Episode 23, Slide 44

14. Which of the following statements is true regarding the coronary sinus?
- a. It is the main vein of the heart
  - b. It courses the anterior section of the coronary sulcus
  - c. It terminates in the left atrium
  - d. All of the above

Ans. A

Ref. Episode 23, Slide 49

15. \_\_\_\_\_ Contraction fibers
- a. SINOATRIAL NODE
  - b. ATRIOVENTRICULAR NODE
  - c. BUNDLE OF HIS
  - d. PURKINJE FIBERS
16. \_\_\_\_\_ Initiates and propagates each heart beat
- a. SINOATRIAL NODE
  - b. ATRIOVENTRICULAR NODE
  - c. BUNDLE OF HIS
  - d. PURKINJE FIBERS
17. \_\_\_\_\_ Located at the base of the right atrium
- a. SINOATRIAL NODE
  - b. ATRIOVENTRICULAR NODE
  - c. BUNDLE OF HIS
  - d. PURKINJE FIBERS
18. \_\_\_\_\_ Transmits the electrical impulse to the ventricles
- a. SINOATRIAL NODE
  - b. ATRIOVENTRICULAR NODE
  - c. BUNDLE OF HIS
  - d. PURKINJE FIBERS

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Ans. 15. C    16. A    17. B    18. D

Ref. Episode 23, Slide 53

19. The amount of blood pumped by the left ventricle in one minute best defines which of the following?
- a. Stroke volume
  - b. Cardiac output
  - c. Ejection fraction
  - d. Ventricular rate

Ans. B

Ref. Episode 23, Slide 55

20. The amount of blood normally pumped by the left ventricle in one contraction normally approximates how many milliliters?
- a. 50 ml
  - b. 60 ml
  - c. 70 ml
  - d. 80 ml

Ans. C

Ref. Episode 23, Slide 55

21. Which of the following is the normal range for an adult heart rate?
- a. 50 – 90 BPM
  - b. 60 – 100 BPM
  - c. 70 – 100 BPM
  - d. Less than 85 BPM

Ans. B

Ref. Episode 23, Slide 56

22. \_\_\_\_\_ 11 – 100 CT calcium score.
- a. No CAD
  - b. Minimal Evidence
  - c. Mild evidence
  - d. Moderate evidence
  - e. Extensive evidence
23. \_\_\_\_\_ 101- 400 CT calcium score.
- a. No CAD
  - b. Minimal Evidence

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- c. Mild evidence
  - d. Moderate evidence
  - e. Extensive evidence
24. \_\_\_\_\_ 0 CT calcium score.
- a. No CAD
  - b. Minimal Evidence
  - c. Mild evidence
  - d. Moderate evidence
  - e. Extensive evidence
25. \_\_\_\_\_ over 400 CT calcium score.
- a. No CAD
  - b. Minimal Evidence
  - c. Mild evidence
  - d. Moderate evidence
  - e. Extensive evidence
26. \_\_\_\_\_ 1 – 10 CT calcium score
- a. No CAD
  - b. Minimal Evidence
  - c. Mild evidence
  - d. Moderate evidence
  - e. Extensive evidence

Ans. 22. C    23. D    24. A    25. E    26. B

Ref. Episode 23, Slide 57

27. \_\_\_\_\_ PITCH is not relative
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
28. \_\_\_\_\_ Discrete acquisition process
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
29. \_\_\_\_\_ “Movie camera”
- a. Retrospective gating

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- b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
30. \_\_\_\_\_ High dose procedure
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
31. \_\_\_\_\_ “Beam on” occurs during the entire cardiac cycle
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
32. \_\_\_\_\_ Used routinely for calcium scoring
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
33. \_\_\_\_\_ Cine loops can be generated
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
34. \_\_\_\_\_ Contraindicated by tachycardia or arrhythmia
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating
35. \_\_\_\_\_ Continuous acquisition process
- a. Retrospective gating
  - b. Prospective gating
  - c. Retrospective and Prospective gating
  - d. Neither Retrospective nor Prospective gating

Ans. 27. B 28. B 29. A 30. A 31. A 32. B 33. A 34. B 35. A

Ref. Episode 23, Slides 69, 71, 74

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36. Which of the following components is responsible for converting the exit beam that contains the radiologic image into electrical impulses?\*
- The analog to digital converter
  - The digital to analog converter
  - The array processor
  - The detector array

Ans. D

Ref. Episode 24, Slide 5

37. The conversion of CT number data to electrical impulses occurs within which of the following components?
- The analog to digital converter
  - The digital to analog converter
  - The array processor
  - The detector array

Ans. B

Ref. Episode 24, Slide 8

38. Determining the degree to which the derived CT number matches the attenuation coefficient of the absorber is best accomplished with which of the following?
- Testing for sensitivity
  - Testing for linearity
  - Testing for uniformity
  - Testing for contrast resolution

Ans. B

Ref. Episode 24, Slide 11

39. The face of the voxel is best represented by which of the following?
- The isotropic voxel
  - The individual CT number
  - The shade of gray demonstrated
  - The pixel

Ans. D

Ref. Episode 24, Slide 12

40. The process whereby a computer is used to manipulate data collected from the detectors to create a CT image is best represented by which of the following?
- Reconstruction convolution
  - Statistical iteration
  - Image reconstruction



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- d. Convolution by kernel

Ans. C

Ref. Episode 24, Slide 13

For questions 41 & 42, please use A for true and B for false.

41. \_\_\_\_ Changing the algorithm changes the way the raw data are manipulated to reconstruct the image. This event occurs within the CT computer.
- a. True
  - b. False

Ans. A

Ref. Episode 24, Slide 18

42. \_\_\_\_ Changing the window setting changes the way the image is viewed. This event occurs at the operator control console.

Ans, A

Ref. Episode 24, Slide 18

43. \_\_\_\_ Convolution
- a. A subset of precise instructions
  - b. Analytic tool that makes signal differentiation possible
  - c. Modifying images through the application of a filter function
  - d. Estimating values in the middle from known values greater and lesser
44. \_\_\_\_ Interpolation
- a. A subset of precise instructions
  - b. Analytic tool that makes signal differentiation possible
  - c. Modifying images through the application of a filter function
  - d. Estimating values in the middle from known values greater and lesser
45. \_\_\_\_ Algorithm
- a. A subset of precise instructions
  - b. Analytic tool that makes signal differentiation possible
  - c. Modifying images through the application of a filter function
  - d. Estimating values in the middle from known values greater and lesser
46. \_\_\_\_ Fourier Transform
- a. A subset of precise instructions
  - b. Analytic tool that makes signal differentiation possible
  - c. Modifying images through the application of a filter function
  - d. Estimating values in the middle from known values greater and lesser

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Ans. 43. C 44. D 45. A 46. B

Ref. Episode 24, Slide 19

47. The application of a filter function to an attenuation profile is most likely the definition for which of the following?
- a. Convolution
  - b. Extrapolation
  - c. Interpolation
  - d. Back-projection

Ans. A

Ref. Episode 24, Slide 35

48. Which of the following is used to minimize image streaks that result from back projection?
- a. Convolution
  - b. Extrapolation
  - c. Interpolation
  - d. Back-projection

Ans. A

Ref. Episode 24, Slide 35

49. The area of the patient's anatomy exposed to x-rays during CT scanning is best described by which of the following?
- a. Display Field of View
  - b. The reconstruction circle
  - c. Scan Field of View
  - d. The collimated field

Ans. C

Ref. Episode 24, Slide 32

50. Which of the following components serves as the location for the reconstruction of binary data?
- a. The ADC
  - b. The DAC
  - c. The detector system
  - d. The Array Processor

Ans. D

Ref. Episode 24, Slide 37

51. Which of the following is a factor that impacts PITCH in MDCT?
1. Table incrementation rate

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2. Tube rotation speed
  3. Slice thickness
  4. Detector system width
- a. 1 through 4
  - b. 1, 2, 4
  - c. 3
  - d. 3, 4

Ans. A

Ref. Episode 25, Slide 4

52. Which of the following is the correct equation to solve for PITCH in MDCT?
- a. Table travel x Beam Width
  - b. Beam Width divided by Table Travel
  - c. Table Travel divided by Beam Width
  - d. Slice thickness x Scanner Generation

Ans. C

Ref. Episode 25, Slide 24

53. Which of the following is a factor impacted by changes in PITCH?
1. Patient dose
  2. Scan resolution
  3. Anatomy covered
  4. Slice PITCH

- a. 1 thru 4
- b. 1, 2, 4
- c. 2, 3, 4
- d. 1, 2

Ans. A

Ref. Episode 25, Slide 30

54. \_\_\_\_\_ As PITCH increases, patient dose decreases.
- a. True
  - b. false

Ans. A

Ref. Episode 25, Slide 31

55. \_\_\_\_\_ As PITCH decreases, image resolution increases.
- a. True
  - b. false

Ans. A

Ref. Episode 25, Slide 32



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- a. Diagnostic radiology
- b. Clinical computed tomography
- c. Nuclear medicine
- d. Interventional radiology

Ans. B

Ref. Episode 26, Slide 8

63. Which of the following is the actual mechanism of biological damage?
- a. Ionization
  - b. Excitation
  - c. Indirect effect
  - d. Direct effect

Ans. A

Ref. Episode 26, Slide 11

64. Regarding the factors that affect dose in CT, which of the following is a true statement?
- 1. As beam geometry decreases, dose decreases
  - 2. As filtration increases, dose decreases
  - 3. As detector efficiency decreases, dose decreases
  - 4. As collimation increases, dose increases
  - 5. As body part size decreases, dose decreases
- a. 1 thru 5
  - b. 1, 2, 5
  - c. 3, 4
  - d. 2, 3, 4

Ans. B

Ref. Episode 26, Slides 13, 14, 15, 16

65. With regard to tube current modulation, which of the following technical factors is the one most likely adjusted?
- a. kVp
  - b. exposure time
  - c. mAs
  - d. mA

Ans. D

Ref. Episode 26, Slide 24

For questions 66 – 69: Use A for true and B for false.

66. \_\_\_\_\_ As kVp increases, dose increases.
- a. True
  - b. false



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d. Organ based TUBE CURRENT MODULATION

73. \_\_\_\_\_ In the X-Y plane

- a. Angular TUBE CURRENT MODULATION
- b. Longitudinal TUBE CURRENT MODULATION
- c. ECG based TUBE CURRENT MODULATION
- d. Organ based TUBE CURRENT MODULATION

Ans. 70. B 71. C 72. D 73. A

Ref. Episode 26, Slide 22

74. With regard to CTDI-vol, which of the following statements is true?

- 1. It is a measure of patient dose
- 2. It should be predicted prior to the scan
- 3. It actually is a measure of tube output
- 4. It is a value that is provided post-scan
- 5. It is a measure of dose along the scanned Z axis

- a. 1 thru 5
- b. 3, 4, 5
- c. 2, 3, 4
- d. 1, 5

Ans. C

Ref. Episode 26, Slides 44, 45, 46

75. The technical factors utilized for a scan plus the scan length used are the primary components for which of the following?

- a. CTDI-vol
- b. DLP
- c. mAs
- d. mAs x kVp

Ans. B

Ref. Episode 26, Slide 46

76. Which of the following statements is true?

- 1. CTDI-vol values for separate series are NOT to be summed to give a total CTDI-vol for a study
- 2. DLP is typically summed over all series in the Post study data page to provide an estimate of the total patient exposure
- 3. If the planned CTDI-vol triggers a Notification, the user has the opportunity to edit or confirm the technique settings

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4. Notification levels may be exceeded when appropriate for a specific patient or diagnostic task

- a. 1 thru 4
- b. 1, 3
- c. 2, 4
- d. 2

Ans. A

Ref. Episode 26, Slides 47, 48

77. Which of the following is actually a measure of CT scanner tube output?

- a. mAs
- b. DLP
- c. kVp
- d. CTDI-vol

Ans. D

Ref. Episode 26, Slide 45

78. With regard to Dose Alert Level Notifications, which of the following statements is true?

- 1. They require specific action by the operator to continue scanning
- 2. They typically take into account all series within the exam
- 3. They require the operator to confirm the protocol and settings and may require the operator to provide a brief explanation
- 4. Dose Alert Levels are much higher than Notification Levels

- a. 1 thru 4
- b. 1, 4
- c. 2, 3
- d. 1, 3

Ans. A

Ref. Episode 26, Slide 49

79. The level of risk associated with a CT scan procedure can be considered acceptable if:

- a. The individual is aware of the risk
- b. The individual receives some commensurate benefit
- c. Everything reasonable has been done to reduce the risk
- d. All of the above

Ans. D

Ref. Episode 26, Slide 55

80. \_\_\_\_\_ The younger the patient, the more sensitive the patient

- a. True
- b. false





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Ans. A

Ref. Episode 26, Slide 67

87. Which of the following is the SI unit that expresses organ dose and technologist dose?
- rem
  - R
  - Seivert
  - Gray

Ans. C

Ref. Episode 26, Slider 73

88. Which of the following is a CT specific patient dose measure?
- CTDI-vol
  - DLP
  - mR centimeters
  - CTDI-100
  - CTDI-w
- 1 thru 5
  - 1, 4, 5
  - 1, 2
  - 1, 2, 4, 5

Ans. C

Ref. Episode 26, Slides 82, 84

89. Calculate adult patient dose when the  $K$  factor for the adult Chest procedure is 0.014 and the exposure is estimated at 300 mGy-cm.
- 420 mSv
  - 4.2 mSv
  - 0.42 mSv
  - 0.042 mSv

Ans. B

Ref. Episode 26, Slide 85

90. The SI limit regarding radiation exposure to the eye lens of a working RT is most likely which of the following?
- 500 mSv
  - 50 mSv
  - 150 mSv
  - 15 rems

Ans. C

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Ref. Episode 26, Slide 86

91. According to a study by Brenner (2006), at what effective dose are children at increased risk?
- 10 mrem
  - 10 mGy
  - 10 mSv
  - 10 R

Ans. C

Ref. Episode 27, Slide 4

92. Adults exposed to what acute dose are at increased risk of cancer?
- 50 mrem
  - 50 mGy
  - 50 mSv
  - 50 R

Ans. C

Ref. Episode 27, Slide 4

93. Which of the following is the unit most closely associated with an amount of energy absorbed per unit mass of material?
- Gy
  - Sv
  - R
  - REP

Ans. A

Ref. Episode 27, Slide 2

94. Which of the following is the unit that expresses effective dose?
- Gy
  - SV
  - R
  - REP

Ans. B

Ref. Episode 27, Slide 3

95. During an adult CT scan of the chest approximately 6 mSv are delivered. How does this approximately compare to the average annual background dose?
- The dose delivered is twice as much
  - The dose delivered approximates 20 times the background dose.
  - The dose delivered is 2000 times that of background
  - The dose delivered is 200 times that of background

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Ans. A

Ref. Episode 27, Slide 10

96. Children are how many times more sensitive to radiation exposure than adults?
- 2 times
  - 5 times
  - 8 times
  - 10 times

Ans. D

Ref. Episode 27, Slide 11

97. Which of the following is a reason why younger patients are at higher risk regarding radiation exposure?
- Younger patients are more radiosensitive
  - Younger patients have more years to live
  - Younger patients are actually not as sensitive as adults
  - The threshold dose approximates 50 mSv
- 1 thru 4
  - 1, 3
  - 2, 4
  - 1, 2

Ans. D

Ref. Episode 27, Slide 9

98. How does one chest CT scan (6 mSv) compare to average annual background dose?
- 2:1
  - 20:1
  - 200:1
  - 2000:1

Ans. A

Ref. Episode 27, Slide 10

99. Which of the following is a factor upon which radiation bio-effects are dependent?
- Patient age
  - Dose rate
  - Tissue sensitivity
  - The area or volume of tissue irradiated
- 1 thru 4
  - 1, 2
  - 3, 4
  - 2, 3, 4



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106. \_\_\_\_\_ Deterministic Effects such as epilation and cataract formation occur as a result of a huge dose delivered in a short period of time.
- True
  - false

Ans. A

Ref. Episode 27, Slide 31

107. \_\_\_\_\_ With regard to Stochastic Effects, there is no “safe” threshold dose and injury probability increases with dose.
- True
  - false

Ans. A

Ref. Episode 27, Slide 33

108. \_\_\_\_\_ As PITCH decreases, dose decreases
- True
  - false

Ans. B

Ref. Episode 27, Slide 49

109. Which of the following is the unit for CTDI(vol)?
- mR
  - mSv
  - mGy
  - rad

Ans, C

Ref. Episode 27, Slide 16

110. Which of the following is the unit for Dose Length Product?
- mGy
  - mR-cm
  - mSv-ml
  - mGy-cm

Ans. D

Ref. Episode 27, Slide 23

111. Which of the following is a basic tenet associated with the appropriate utilization of radiation?
- The CT procedure must be justified
  - Repeat studies should be avoided
  - The exam should be tailored to the patient
  - Ultrasound or MRI should be used if they provide equal or more information

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5. The benefit of performing the CT procedure should outweigh the risk

- a. 1, 4, 5
- b. 2, 3, 4
- c. 1, 2, 3
- d. 1 thru 5

Ans. D

Ref. Episode 27, Slide 36

112. Which of the following is a basic tenet associated with the optimization of a CT protocol?

- 1. Scan range should be limited to the region of interest
- 2. The adjustment of CT parameters like mA and kVp should be optimized
- 3. The number of contrast phases should be limited
- 4. The protocol should be adapted to the clinical indication

- a. 1, 2
- b. 3, 4
- c. 1, 3, 4
- d. 1, 2, 3, 4

Ans. D

Ref. Episode 27, Slide 37

113. Which of the following would result in a reduction in CT dose?

- 1. Increase PITCH
- 2. Instead of 140, routinely utilize kilovoltages that are 80 to 100
- 3. Implement the utilization of automated kVp
- 4. Utilize Tube Current Modulation
- 5. Appropriately Shield superficial organs
- 6. Utilize Iterative Reconstruction

- a. 1, 3, 4, 5
- b. 2, 4
- c. 5, 6
- d. 1 thru 6

Ans. D

Ref. Episode 27, Slide 47

114. In which scan mode are multiple acquisitions covering the same body region acquired?

- a. Helical
- b. Dynamic
- c. Scanogram
- d. Axial

Ans. B

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Ref. Episode 28, Slide 6

115. Which of the following best describes the movement of the table through the bore of the scanner over a full 360 degree rotation?
1. Table feed
  2. PITCH
  3. Table increment
  4. DLP
- a. 1 thru 4
  - b. 2, 4
  - c. 1, 3
  - d. 1, 2, 3

Ans. C

Ref. Episode 28, Slide 7

116. Which of the following Acquisition Parameter Settings will impact PITCH either directly or indirectly?
1. Scan mode
  2. Table feed/increment
  3. Detector configuration
  4. Exposure time per rotation
  5. Beam shaping filter
  6. Field of measurement
- a. 1 thru 6
  - b. 2, 3, 4
  - c. 1, 2, 4, 6
  - d. 2, 3, 6

Ans. B

Ref. Episode 28, Slide 3, 4\*

117. \_\_\_\_\_ Multiply Tube Current times the Exposure time per rotation.
- a. Detector configuration
  - b. Tube potential
  - c. Tube current time product
  - d. Field of Measurement

Ans. C

Ref. Episode 28, Slide 14

118. \_\_\_\_\_ This is a measure of the diameter of the primary beam in the axial plane at the gantry iso-center.



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- a. Detector configuration
- b. Tube potential
- c. Tube current time product
- d. Field of Measurement

Ans. D

Ref. Episode 28, Slide 15

119. \_\_\_\_\_ Describes the combination of the number of data channels and considers the width of each detector associated with each data channel
- a. Detector configuration
  - b. Tube potential
  - c. Tube current time product
  - d. Field of Measurement

Ans. A

Ref. Episode 28, Slide 8

120. \_\_\_\_\_ Is a measure of the electrical potential applied across the x-ray tube to accelerate electrons toward the target
- a. Detector configuration
  - b. Tube potential
  - c. Tube current time product
  - d. Field of Measurement

Ans. B

Ref. Episode 28, Slide 13

121. Which of the following is the scanner component that modifies the energy spectrum and spatial distribution of the primary beam?
- a. The beam shaping filter
  - b. The ADC
  - c. The detector system
  - d. The aperture grid

Ans. A

Ref. Episode 28, Slide 16

122. With regard to the Electromagnetic Spectrum, which of the following statements is true?
1. As wavelength increases, energy increases
  2. As frequency decreases, energy decreases
  3. Photons exist at the speed of light or they don't exist
  4. No member of the EM spectrum has mass

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- a. 1 thru 4
- b. 3, 4
- c. 1, 2
- d. 2, 3, 4

Ans. D

Ref. Episode 28, Slide 19

123. Which of the following is an ionization event that occurs within the tissue of the patient being irradiated?
- 1. Bremsstrahlung
  - 2. Photoelectric effect
  - 3. Compton scatter
  - 4. Characteristic
- a. 1, 2
  - b. 2, 3
  - c. 3, 4
  - d. 2, 4

Ans. B

Ref. Episode 28, Slides 17, 18, 20, 21

124. During which trimester are fetal risks to radiation exposure the highest
- a. First
  - b. Second
  - c. Third
  - d. Fourth

Ans. A

Ref. Episode 28, Slide 25

125. Which of the following represents the fetal threshold radiation dose?
- a. 10 mGy
  - b. 50 mGy
  - c. 75 mGy
  - d. 100 mGy

Ans. D

Ref. Episode 28, Slide 26

126. From which of the following CT procedures performed on a pregnant woman will the greatest dose to the fetus be delivered?\*
- a. Abdomen
  - b. Head

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- c. Pelvis
- d. Chest

Ans. C

Ref. Episode 28, Slide 27

127. Which of the following components helps to reduce the production of scatter radiation the most?
- a. The beam shaping filter
  - b. The pre-patient collimator
  - c. The pre-detector collimator
  - d. Reduce the kVp from that programmed in the protocol by 50% or more

Ans. B

Ref. Episode 28, Slide 35

128. Dose reduction in CT is best accomplished implementing which of the following?
- a. Optimizing mAs & kVp selection
  - b. Increasing PITCH
  - c. The programming of non-contiguous slices
  - d. Increasing filtration and appropriate shielding

Ans. D

Ref. Episode 28, Slide 30

129. \_\_\_\_\_ In MDCT, doses in organs with similar tissue make-up, dose tends to be more uniform
- a. True
  - b. false

Ans. A

Ref. Episode 28, Slide 29

130. \_\_\_\_\_ Because gas detector systems possess a lower photon absorption rate, skin dose is higher
- a. True
  - b. false

Ans. A

Ref. Episode 28, Slide 32

131. \_\_\_\_\_ In MDCT, because mAs is constant any increase in kVp results in decreased dose.
- a. True
  - b. false

Ans. B

Ref. Episode 28, Slide 33

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132. With helical CT, additional rotations are required before and after the area of interest for optimal quality to occur. This is which of the following?
- Improper collimation
  - Over-ranging or Z-axis over-scanning
  - Tube current modulation
  - Out-of-field artifact

Ans. B

Ref. Episode 28, Slide 49

133. Where in the CT suite is the safest place with regard to exposure from scatter radiation?
- At the head of the table
  - At the foot of the table
  - Outside the room
  - Stand within the plane of the gantry

Ans. D

Ref. Episode 28, Slide 39

For questions 134 – 140: Use A for true and B for false and the following statement:

WITH REGARD TO THE FACTORS THAT AFFECT PATIENT DOSE IN CT....

134. \_\_\_\_\_ As patient centering accuracy decreases, dose increases
- True
  - false
135. \_\_\_\_\_ As effective mAs increases, dose increases
- True
  - false
136. \_\_\_\_\_ As collimation decreases, dose decreases
- True
  - false
137. \_\_\_\_\_ As PITCH increases, dose decreases
- True
  - false
138. \_\_\_\_\_ As the number of detectors increases, dose increases
- True
  - false
139. \_\_\_\_\_ If the patient is centered too high in the gantry it is possible that the implemented tube current modulation will assume the patient is larger than they are
- True
  - false
140. \_\_\_\_\_ As the number of detector rows increase, dose decreases
- True
  - false

Answers:

134. A      135. A      136. B      137. A      138. B      139. A      140. A

Ref. Episode 28, Slides 42, 46, 52