

電腦斷層測驗
Computed Tomography

2017年8月27日 星期日

1. 除題意不清楚或是圖片有問題，禁止詢問與試題有關的問題。
2. 應答時禁止使用任何文件。
3. 請在電腦答案卡上圈選作答

項 目	填寫內容：
姓名	您的中文與英文姓名
試題名稱	CT Test
項目	不用填寫
科目	不用填寫
受試者識別代碼	您的准考證號碼 <u>17XXX</u> 將您選定之數字的圓圈塗滿。
科目代碼	不用填寫
地點代碼	不用填寫
作答方式	本測驗共有90題問題。請使用1到90作答欄位。 請將測驗卷Q1的答案於Answer Choices1填入答案卷。 Q2 = Answer Choices2，Q3 = Answer Choices3.....Q90 = Answer Choices90。

CT

- Q1. Select the one that is used as an X-ray detector in CT.
- (A) Semiconductor detector
 - (B) Scintillation counter
 - (C) Ionization chamber
 - (D) Germanium detector
 - (E) Survey meter
- Q2. Select the one that is a constituent part of a CT device.
- (A) RF coil
 - (B) CR reader
 - (C) Slip ring
 - (D) Compression plate
 - (E) Flattening filter
- Q3. Select the name of one device with multiple data collection systems.
- (A) Helical CT
 - (B) IVRCT
 - (C) Multi-slice CT
 - (D) Cluster CT
 - (E) Pencil beam CT
- Q4. Select the generation of CT devices generally used now (choose one).
- (A) First generation
 - (B) Second generation
 - (C) Third generation
 - (D) Fourth generation
 - (E) Fifth generation
- Q5. Select the CT image reconstruction method that is implemented in recent CT devices to reduce exposure.
- (A) Filtered back projection
 - (B) Two-dimensional Fourier transformation

- (C) One-dimensional Fourier transformation
- (D) Vector reconstruction
- (E) Successive approximation

Q6. Select the one that is NOT included when evaluating performance of CT.

- (A) SD
- (B) Slice thickness measurement
- (C) Contrast scale
- (D) Spatial resolution
- (E) T1 measurement

Q7. The CT value is based on the X-ray attenuation coefficient of a certain material. Select this material from the following (choose one).

- (A) Air
- (B) Water
- (C) Bone
- (D) Fat
- (E) Blood

Q8. Select the correct statement from the following statements.

- (A) The CT value (HU) is 1,000 in water and -1,000 in air.
- (B) The stop ring mechanism made helical scanning possible.
- (C) Decreasing the window width reduces contrast.
- (D) DICOM is a standard established to standardize CT values.
- (E) A water phantom is generally used to evaluate spatial resolution of X-ray CT.

Q9. Select the correct statement from the following statements.

- (A) The slice thickness affects the resolution of MPR, etc.
- (B) CTDI is affected by the reconstruction function.
- (C) A synogram shows input data collected by the channels in each projection during scanning.
- (D) The spatial resolution (high contrast resolution) of the slice plane is affected by X-ray tube current.
- (E) Noise characteristics do not affect the image reconstruction function.

Q10. Select the correct statement from the following statements.

- (A) CNR is the noise-to-slice thickness ratio.
- (B) The slice sensitivity profile is a scale of amplitude of the noise component that corresponds to each frequency.
- (C) NPS is affected by the reconstruction filter function.
- (D) CT dose index (CTDI) is defined as line integrated dose multiplied by X-ray beam width (BW).
- (E) The CTDI_{vol} decreases when the pitch factor (PF) is decreased with respect to the X-ray beam width.

Q11. Select the correct statement from the following statements.

- (A) The dual energy method and the metal artifact reduction method are two methods for removing bone artifacts.
- (B) The virtual endoscopy (VE) method is a perspective projection method.
- (C) Reducing slice thickness increases the influence of partial volume effect.
- (D) Increasing helical pitch reduces helical artifacts in the axial plane.
- (E) A function focused on high contrast resolution is chosen when observing soft tissue using the VR method.

Q12. Select the wrong statement from the following statements.

- (A) The reconstruction interval of a three-dimensional image affects the spatial resolution along the Z-axis.
- (B) Using a reconstruction function that emphasizes high frequency results in a good three-dimensional CT image regardless of the amount of noise.
- (C) The horizontal axis of a synogram plane is the channel.
- (D) 360° interpolation reconstruction uses projection data from two rotations.
- (E) The Feldkamp method is a three-dimensional reconstruction method that takes the cone angle into account.

Q13. Select the correct statement from the following statements.

- (A) Frequency characteristics can be obtained from image noise measurements based on SD values.
- (B) The focal point size does not affect spatial resolution.
- (C) The designated slice thickness and the effective slice thickness is always the same.

- (D) A shower-shaped artifact appears when a certain detector is always malfunctioning.
- (E) Making the image reconstruction interval smaller than the slice thickness (overlap reconstruction) increases the spatial resolution along the body axis.

Q14. Select the correct statement from the following statements.

- (A) In multislice CT, images with different slice thicknesses can be obtained even with a non-helical scan.
- (B) CT-AEC is a function to control X-ray tube voltage using the positioning image of the scan data obtained immediately before.
- (C) The filtered back projection method is a forward projection of data with various angles.
- (D) Regarding factors that affect image quality, image noise increases when the pitch factor is lower when the imaging dose is the same.
- (E) A ring artifact appears on the image when the X-ray tube output decreases.

Q15. Select the correct statement from the following statements.

- (A) The CT value depends on the dose.
- (B) Scatter artifacts cannot be suppressed using software.
- (C) A CT value consists of 10 bits.
- (D) Half reconstruction improves temporal resolution.
- (E) Exposure from overbeaming can be neglected during clinical operations.

Q16. Select the correct statement from the following statements.

- (A) Doubling the X-ray tube current results in a four-fold increase in image noise.
- (B) The pitch factor is bed movement divided by effective slice thickness.
- (C) Increasing the X-ray tube rotation speed is effective in suppressing motion artifacts.
- (D) Checking of previous images should be performed as little as possible; otherwise the exam time would become longer.
- (E) Checking of kidney functions is not necessary for contrast radiography

Q17. Select the wrong statement from the following statements.

- (A) The beam pitch is set to less than 1 when scanning a wide range quickly during a routine exam.
- (B) The CT display tone is eight bits, thus narrowing the window range can provide contrast between small differences in CT value.
- (C) Increasing the number of views of the detectors improves the resolution of the images.
- (D) Based on the relation between view and channel, an error in one channel of one view appears as a streak artifact.
- (E) The principle of CT image reconstruction is based on the Radon theorem.

Q18. Select the correct statement from the following statements.

- (A) Positioning can be corrected by reconstruction, therefore does not affect the image quality.
- (B) The time enhancement curve (TEC) shows the relation between organ CT value and elapsed time.
- (C) If the contrast conditions are the same, the contrast effect is lower when the effective X-ray tube voltage is lower.
- (D) The test boros method is not used to correct the contrast timing.
- (E) Regarding medical exposure, justification of medical methodology, optimization of exposure that is in balance with medical objectives, and introduction of new exposure reduction technologies are important.

Q19. Select the correct statement from the following statements.

- (A) The spatial resolution increases when the focal point size is increased.
- (B) The dose must be increased to eight-fold to halve the image noise.
- (C) The SSP is the same regardless of the scanning method (helical or conventional) if the preset slice thickness is the same.
- (D) CTDI is mainly used to manage exposure dose of individuals.
- (E) Overscanning and overranging results in much unnecessary exposure that does not contribute to reconstruction.

Q20. Select the correct statement from the following statements.

- (A) A bowtie filter is placed to adjust slice thickness.

- (B) The range of CT value shown with contrast is -200 to +50 when WW is 200 and WL is 50.
- (C) The image reconstruction interval is not a factor that affects the quality of three-dimensional images.
- (D) The spatial resolution is an index that shows the minimum size that can be distinguished.
- (E) In general, the filming dose and reconstruction filter function do not affect the results of SSP/z.

Q21. Select the correct statement from the following statements.

- (A) The absorption dose is categorized as a protection quantity.
- (B) CTDI cannot be used to control accuracy.
- (C) A smaller dose efficiency results in larger exposure.
- (D) The dose linearly increases with increasing X-ray tube voltage.
- (E) Scanning is performed such that the diagnostic reference level is never exceeded.

Q22. Select the correct statement from the following statements.

- (A) Daily inspection is important from the viewpoint of corrective maintenance of CT equipment.
- (B) Warming up of the X-ray tube is performed when the CT equipment has not been used for a long time.
- (C) Maintenance plan document of the contrast medium injection equipment is not required to be attached within the standards of the facility where CT scanning is conducted.
- (D) Tuberculosis is a contagious disease.
- (E) It is not necessary to confirm whether the subject is using a pacemaker or ICD prior to a CT exam.

Q23. Select the correct statement from the following statements.

- (A) Ionic X-ray contrast media has lower side effect frequency compared to non-ionic X-ray contrast media.
- (B) The shape of the time density curve depends on the contrast medium injection time.

- (C) The time density curve plots the CT value on the vertical axis and the body weight on the horizontal axis, and is an index to objectively evaluate the contrast effect in a contrast CT exam.
- (D) A fixed amount of contrast medium should be administered regardless of the subject's body build.
- (E) Contrast media are safe drugs, thus there is no need to explain side effects to the subject.

Q24. Select the correct statement from the following statements.

- (A) $CTDI_{vol}$ decreases with increasing X-ray tube current.
- (B) DLP is not affected by scanning length.
- (C) X-ray tube current is a factor that affects CNR
- (D) Multiple reflections affect artifacts on the CT image.
- (E) Barium sulfate remaining in digestive organs does not appear as artifacts.

Q25. Select the correct statement from the following statements.

- (A) In the low voltage slip ring method, voltage is stepped up and then high voltage is supplied to the X-ray tube through a slip ring,
- (B) The beam pitch is set to less than 1 when scanning a wide range quickly during a routine exam.
- (C) Gears and timing belts are employed in the linear motor direct drive method, which is a method to drive the gantry in the CT equipment.
- (D) The effective slice thickness is almost the same between the center and edges on the slice in images reconstructed using a three-dimensional reconstruction method that takes the cone angle into effect.
- (E) Dual energy CT has higher spatial resolution compared to standard CT.

Q26. Select the correct statement from the following statements.

- (A) The scanning time in translate/rotate method is short with only few seconds because there are approximately 700 to 900 detectors.
- (B) Afterglow is one characteristic of a scintillator, which converts X-rays into light.
- (C) A short afterglow results in bad X-ray detection characteristics.
- (D) The reconstruction function can be convoluted with both raw data and image data.

- (E) The 180-degree reconstruction method uses only actual data to achieve high density sampling.

Q27. Select the wrong statement from the following statements.

- (A) The principle of CT image reconstruction is based on the Radon theorem.
- (B) Simple back projection blurs the reconstructed image; therefore the blur is corrected by applying a filter on the projected data.
- (C) ML-EM and MAP-EM are approximation methods in successive approximation.
- (D) In a Fourier-transformed CT image data in frequency domain, the center consists of high-frequency components.
- (E) The effective slice thickness is thinner in 180-degree opposite beam interpolation compared to 360-degree interpolation.

Q28. Select the correct statement from the following statements.

- (A) It is scientifically proven that there is a threshold dose that results in stochastic effects.
- (B) When the reconstruction interval used to generate MPR becomes finer, the spatial resolution becomes better in accordance.
- (C) The reconstruction function to be used to generate MPR may be the same as that for axial images used in diagnosis.
- (D) Functions that emphasize high frequency, which are used to diagnose bone and lung field, are preferred choices for the reconstruction function for generating VR images.
- (E) The difference in CT value (high versus low) is shown on a SR image.

Q29. Select the correct statement from the following statements.

- (A) Changing the X-ray tube voltage changes the CT value.
- (B) Increasing the X-ray tube current increases noise.
- (C) Changing the helical pitch does not change slice thickness, noise, nor temporal resolution.
- (D) A wire phantom is used to measure density resolution.
- (E) NPS is an index of spatial resolution.

Q30. Select the correct statement from the following statements.

- (A) A short afterglow results in bad X-ray detection characteristics.
- (B) The reconstruction function can be convoluted with both raw data and image data.
- (C) The 180-degree reconstruction method uses only actual data to achieve high density sampling.
- (D) The effective slice thickness increases in proportion to the helical pitch in single helical CT, but does not always depend on the helical pitch in multi-slice CT.
- (E) The ECG-gated reconstruction method makes examination possible with a low exposure dose and can be used in patients with high heart rate.

Q31. Select the correct statement from the following statements.

- (A) The reconstruction function can be convoluted with both raw data and image data.
- (B) The 180-degree reconstruction method uses only actual data to achieve high density sampling.
- (C) The effective slice thickness increases in proportion to the helical pitch in single helical CT, but does not always depend on the helical pitch in multi-slice CT.
- (D) The ECG-gated reconstruction method makes examination possible with a low exposure dose and can be used in patients with high heart rate.
- (E) A noise reduction filter reduces noise by a smoothing process, and there is no degradation of resolution properties.

Q32. Select the correct statement from the following statements.

- (A) MPR cannot be drawn on an arbitrary cross-section.
- (B) MinIP is a method to project the maximum CT value.
- (C) VR displays the target two-dimensionally based on two parameters: threshold value and transmittance.
- (D) Decreasing the slice thickness improves the Z-axis resolution because the partial volume effect becomes stronger.
- (E) Three-dimensional image generation using isotropic voxel data results in less distortion.

Q33. Select the correct statement from the following statements.

- (A) CTDI, DLP, and DE are indices of dose from CT equipment that are defined by the International Electrotechnical Commission (IEC).
- (B) Weighted CTDI ($CTDI_w$) is obtained from measurements at the edges of a PMMA phantom.
- (C) Changing the pitch factor from 1 to 0.5 in a helical scan causes a fourfold increase of the $CTDI_{vol}$ value.
- (D) Using the effective dose allows qualitative comparison of exposure dose between different modalities.
- (E) Exams where the CTDI and DLP values exceed the diagnostic reference level must not be conducted.

Q34. Select the wrong statement from the following statements.

- (A) Increasing the X-ray tube voltage reduces image noise (SD).
- (B) Decreasing the slice thickness increases spatial resolution along the body axis.
- (C) Increasing the number of views improves spatial resolution.
- (D) If the X-ray tube voltage and current are kept constant, the exposure decreases when the pitch is increased.
- (E) The image noise decreases when a function emphasizing high frequency is used.

Q35. Select the correct statement from the following statements.

- (A) Children have more fat in the abdominal cavity and the organs are smaller compared to adults, therefore the boundaries between organs and tissue are less distinct.
- (B) Use of injectors on children is an absolute contraindication.
- (C) Dual energy CT uses two kinds of X-ray tube current.
- (D) In dual energy scanning, a smaller difference in X-ray photon energies is preferable.
- (E) There are three parameters in contrast medium injection: contrast medium injection rate, injection duration, and total contrast medium volume.

Q36. Select the correct statement from the following statements.

- (A) To reduce stair step artifacts in a three-dimensional image, the slice thickness should be reduced and the reconstruction interval should be less than one-half of the slice thickness.
- (B) The reconstruction interval of three-dimensional images affects the spatial distribution along the X-axis.
- (C) Maximum intensity projection (MIP) is a method to project volume data from a certain direction by choosing the largest CT value in a voxel.
- (D) Using a reconstruction function that emphasizes high frequency results in a good three-dimensional CT image regardless of the amount of noise.
- (E) The vertical axis of a synogram plane is the channel.

Q37. Select the wrong statement from the following statements.

- (A) Among representative reconstruction methods, filtered back projection (FBP) is an analytical method while maximum likelihood expectation maximization (MLEM) is an algebraic method.
- (B) 360° interpolation reconstruction uses projection data from two rotations.
- (C) The Feldkamp method is a three-dimensional reconstruction method that takes the cone angle into account.
- (D) Increasing temporal resolution can suppress stair step artifacts.
- (E) SSP measurements use microcoin phantoms and microsphere phantoms, and obtained images are used as impulse response.

Q38. Select the correct statement from the following statements.

- (A) For parts where high resolution images are necessary, such as bone or inner ear, an image (post-process) filter is applied to a function for soft tissue to increase reconstruction FOV.
- (B) An isotropic voxel is a pixel with large CT value.
- (C) VR is a general name for MPR, CPR, and MIP.
- (D) The image reconstruction interval affects density resolution of a three-dimensional image.
- (E) Non-linear filters are commonly used to reduce image noise.

Q39. Select the correct statement from the following statements.

- (A) RMS can objectively show the resolution of an image.
- (B) In general, the slice thickness is the width at half maximum of the slice sensitivity profile (SSP).
- (C) Evaluation using CNR is appropriate when the frequency characteristics of the image have changed.
- (D) Changing the X-ray tube voltage does not change the CT value of the contrast medium.
- (E) Decreasing the X-ray tube rotation speed suppresses motion artifacts.

Q40. Select the correct statement from the following statements.

- (A) The SD value was high; therefore the current was decreased to lower the SD value.
- (B) Shoulder artifacts were prominent; therefore the X-ray tube voltage was decreased.
- (C) Motion artifacts were prominent; therefore the X-ray tube rotation speed was increased.
- (D) Motion artifacts were prominent; therefore the helical pitch was decreased.
- (E) The helical pitch was decreased to shorten CT scan time.

Q41. Select the number of segments of the right lung (choose one).

- (A) 6
- (B) 7
- (C) 8
- (D) 9
- (E) 10

Q42. Select the number of cranial nerves that penetrate the cranial base (choose one).

- (A) 9
- (B) 10
- (C) 11
- (D) 12
- (E) 13

Q43. Select the number of bones in a carpal (choose one).

- (A) 8
- (B) 9
- (C) 10
- (D) 11
- (E) 12

Q44. Select the number of segments of the liver (choose one).

- (A) 8
- (B) 9
- (C) 10
- (D) 11
- (E) 12

Q45. Select the number of sections in the coronary artery as defined by the American Heart Association (AHA) (choose one).

- (A) 12
- (B) 13
- (C) 14
- (D) 15
- (E) 16

Q46. Select the feeding vessel of the lung (choose one).

- (A) Pulmonary vein
- (B) Brachial artery
- (C) Bronchial artery
- (D) Internal mammary artery
- (E) Celiac artery

Q47. Select the feeding vessel of the liver (choose one).

- (A) Pulmonary artery
- (B) Brachial artery
- (C) Portal vein
- (D) Internal mammary artery
- (E) Common carotid artery

- Q48. Select the bone that is part of a shoulder joint.
- (A) Cervical spine
 - (B) Forearm bone
 - (C) Shoulder bone
 - (D) Rib
 - (E) Breast bone
- Q49. Select the organ where the feeding vessel is the inferior mesenteric artery.
- (A) Rectum
 - (B) Liver
 - (C) Lung
 - (D) Kidney
 - (E) Adrenal gland
- Q50. Select the blood vessel that does NOT branch off from the celiac artery.
- (A) Splenic artery
 - (B) Gastroduodenal artery
 - (C) Hepatic artery proper
 - (D) Pancreaticoduodenal artery
 - (E) Portal vein
- Q51. Select the change in settings that reduces exposure.
- (A) Decreasing helical pitch
 - (B) Increasing X-ray tube current
 - (C) Decreasing X-ray tube rotation speed
 - (D) Decreasing SD in auto exposure control (AEC) settings
 - (E) Decreasing X-ray tube voltage.
- Q52. Regarding scanning conditions, select the part where the SD is to be set to the smallest value.
- (A) Head
 - (B) Breast
 - (C) Abdomen
 - (D) Pelvis
 - (E) Joint

Q53. Select the artifact that does not appear in CT.

- (A) Windmill artifact
- (B) Chemical shift artifact
- (C) Ring artifact
- (D) Stair step artifact
- (E) Streak artifact

Q54. Select the disease where image diagnosis using simple CT is superior to using MRI.

- (A) Acute phase stroke
- (B) Hepatoma
- (C) Cerebral hemorrhage
- (D) Cerebral aneurysm
- (E) Anterior cruciate ligament tear

Q55. Select the contrast agent usually used in CT.

- (A) Non-ionic iodine contrast agent
- (B) Ionic iodine contrast agent
- (C) Oil-based iodine contrast agent
- (D) Gd contrast agent
- (E) Fe ion contrast agent

Q56. Choose the procedure that corresponds to the following text.

“Method that shows the minimum value in the matrix on the projection line”

- (A) Maximum intensity projection (MIP)
- (B) Minimum intensity projection (MinIP)
- (C) Volume rendering (VR)
- (D) Shaded surface display (SSD)
- (E) Multi-planar reconstruction (MPR)

Q57. Choose the procedure that corresponds to the following text.

“Method that sets opacity and tone to boxels and then processes using a threshold”

- (A) Maximum intensity projection (MIP)
- (B) Minimum intensity projection (MinIP)

- (C) Volume rendering (VR)
- (D) Shaded surface display (SSD)
- (E) Multi-planar reconstruction (MPR)

Q58. Choose the procedure that corresponds to the following text.

“Method that reflects the maximum intensity (CT value) in a boxel on the plane of projection to generate a three-dimensional image”

- (A) Maximum intensity projection (MIP)
- (B) Minimum intensity projection (MinIP)
- (C) Volume rendering (VR)
- (D) Shaded surface display (SSD)
- (E) Multi-planar reconstruction (MPR)

Q59. Choose the procedure that corresponds to the following text.

“Process that defines a CT value, shows regions with CT values higher than the defined value, and then pastes small faces (polygons) at the boundary”

- (A) Maximum intensity projection (MIP)
- (B) Minimum intensity projection (MinIP)
- (C) Volume rendering (VR)
- (D) Shaded surface display (SSD)
- (E) Multi-planar reconstruction (MPR)

Q60. Choose the procedure that corresponds to the following text.

“Method to generate images for an arbitrary cross-section based on volume data”

- (A) Maximum intensity projection (MIP)
- (B) Minimum intensity projection (MinIP)
- (C) Volume rendering (VR)
- (D) Shaded surface display (SSD)
- (E) Multi-planar reconstruction (MPR)

Q61. Select the part where beam hardening correction is most important.

- (A) Head
- (B) Neck
- (C) Breast

- (D) Abdomen
- (E) Pelvis

Q62. Select the reconstruction function that is most suitable in high resolution CT (HRCT).

- (A) Function for soft part
- (B) Function for head
- (C) Function for bone
- (D) Function for 3D uses
- (E) Function for low contrast

Q63. Select the maximum slice thickness appropriate in HRCT.

- (A) 10mm
- (B) 8mm
- (C) 5mm
- (D) 3mm
- (E) 2mm

Q64. Select one statement that is appropriate regarding contrast of images in a dynamic liver exam.

- (A) Hepatoma was enhanced in white in the arterial phase.
- (B) Liver cyst was enhanced in white in the arterial phase.
- (C) Liver cyst was enhanced in white in the equilibrium phase.
- (D) Hemangioma of liver was enhanced in white in the arterial phase.
- (E) Hemangioma of liver was shown in black and contrast medium was already expelled in the arterial phase.

Q65. Select one statement that is appropriate regarding contrast of images in a dynamic liver exam.

- (A) Pancreatic cancer was enhanced in white in the arterial phase.
- (B) Pancreatic cancer was shown in black and was not enhanced with contrast medium in the arterial phase.
- (C) Pancreatic cyst was enhanced in white in the equilibrium phase.
- (D) Pancreatic cyst was enhanced in white in the arterial phase.

- (E) Pancreatic calculus was shown in black and was not enhanced with contrast medium in the equilibrium phase.

Q66. Select one statement that is appropriate regarding breast CT.

- (A) The reconstruction function must be a function for soft parts.
- (B) The lung field is filled with air, a dose larger than in abdomen CT was used.
- (C) To obtain a clear image of the lung field, WW was set to approximately -1500 and WL to about -500.
- (D) A function with high sharpness was used for mediastinal space.
- (E) No contrast medium was used to check blood vessels.

Q67. Select the phenomenon that is NOT a side effect of iodine contrast agents.

- (A) Vomiting
- (B) Rubefaction
- (C) Decrease of blood pressure
- (D) Difficulty in breathing
- (E) Convulsive seizure

Q68. Select the term that is not related to coronary artery CT.

- (A) Prospective gating
- (B) Retrospective gating
- (C) ECG mA modulation
- (D) Test boros method
- (E) Xenon contrast agent

Q69. Select the image processing that is not used in coronary artery CT.

- (A) MIP
- (B) MinIP
- (C) VR
- (D) Curved MPR
- (E) Stretch MPR

Q70. When providing images of the vertebral body, from which direction should the image be taken?

- (A) Axial

- (B) Coronal
- (C) Sagittal
- (D) Curved MPR
- (E) Radial MPR

Q71. When providing images of a shoulder joint, from which direction besides AX should the images be taken?

- (A) Oblique coronal
- (B) Coronal
- (C) Sagittal
- (D) Curved MPR
- (E) Radial MPR

Q72. When providing images for imaging finding of appendicitis, from which direction besides AX should the images be taken?

- (A) Oblique coronal
- (B) Coronal
- (C) Sagittal
- (D) Curved MPR
- (E) Radial MPR

Q73. Select the correct statement regarding kidney CT.

- (A) Tumor lesions of the liver are more frequently found with CT exams compared to ultrasound exams.
- (B) Simple CT is not necessary in diagnosing kidney tumor.
- (C) Contrast methods do not require multilayer scanning, and scanning of a single layer is sufficient for diagnosis.
- (D) Liver cyst is polycystic, therefore thin slice images are not necessary.
- (E) Liver cysts are affected by renal parenchyma in contrast imaging, therefore shows high CT value.

Q74. Select the correct statement regarding reconstructed slice thickness in CT.

- (A) The reconstructed slice thickness should be the minimum slice thickness of the equipment.

- (B) The reconstructed slice thickness has little effect in generating MPR.
- (C) The reconstructed slice thickness should be about one-half of the detector opening width.
- (D) The MTF of MPR is not related to the reconstructed slice thickness.
- (E) The reconstructed slice thickness should be about the same as the detector opening width.

Q75. Select the correct statement regarding the time enhancement curve (TEC).

- (A) The pharmacokinetics of the contrast agent cannot be judged just by keeping the TEC constant.
- (B) The TEC shows that the CT value of the effective organ is proportional to the injection rate if the total volume of iodine is constant.
- (C) The TEC shows that the CT value of the arterial system is proportional to the injection rate if the total volume of iodine is constant.
- (D) Changes in patient factors between individual patients are not a problem when performing contrast imaging using TEC.
- (E) When performing contrast imaging using TEC, CT values of the arterial systems are not affected by physical factors on the CT equipment side.

Q76. Select the correct statement regarding CT colonography (CTC).

- (A) The tagging method is not useful.
- (B) The virtual endoscopy method is used in image processing of CTC.
- (C) Scanning performed on the dorsal position is sufficient.
- (D) CTC has a higher detection rate of surface tumors compared to endoscopy.
- (E) Residue is not a problem in CTC.

Q77. Select the correct statement regarding CT on children.

- (A) A characteristic of children is that body motion is small.
- (B) The growth process of children does not have to be considered.
- (C) The contrast in white and grey matter in the head of children is lowest at age 1.
- (D) The heart rate is not relevant in a breast scan of a child.
- (E) Children are generally sedated during scanning, therefore the scan duration does not have to be considered.

Q78. Select the correct statement regarding diagnostic reference level (DRL).

- (A) The DRL differs by country.
- (B) The DRL is applied to exposure of individual patients.
- (C) The DRL is set regardless of the diagnostic value.
- (D) The DRL is a dose that must not be exceeded.
- (E) The DRL basically targets deterministic effects.

Q79. Select the part where image processing is NOT carried out using the virtual endoscopy method.

- (A) Large intestine
- (B) Cerebral aneurysm
- (C) Bronchi
- (D) Aorta
- (E) Spinal cord cavity

Q80. Select the correct statement regarding head CT angiography (CTA).

- (A) Screening of cerebral aneurysm is more highly recommended than MR.
- (B) The scan slice thickness should be 1 mm or less.
- (C) The boros tracking method is not recommended.
- (D) Beam hardening correction is not related to CTA.
- (E) FOV should be as large as possible.

Q81. Select the correct statement regarding abdomen CT angiography (CTA).

- (A) Abdomen CTA is useful in early diagnosis and follow-up observation of aortic dissection.
- (B) The scan slice thickness should be 5 mm or less.
- (C) The boros tracking method is not recommended.
- (D) It is not useful in diagnosis of renal artery stenosis.
- (E) It is not appropriate to conduct exams on arteries of lower limbs immediately afterwards.

Q82. Select the correct statement regarding sequential approximation.

- (A) The reconstruction speed is faster than FBP.
- (B) The reconstructed image looks like textures that are pasted.

- (C) SD improves poorer compared to FBP.
- (D) There are more artifacts compared to FBP.
- (E) The resolution is the same as FBP.

Q83. Select the correct statement regarding CT on arteries of lower limbs.

- (A) Simultaneous scanning with pulmonary arteries is not possible.
- (B) It is useful for diagnosis of deep vein thrombosis.
- (C) The amount of iodine is irrelevant.
- (D) The X-ray tube voltage is not related to image quality.
- (E) Image processing is not necessary.

Q84. Select the correct statement regarding CT in critical care.

- (A) CT is a primary survey exam.
- (B) Diagnosis is based on MPR, and images should be taken with as thin slices as possible.
- (C) CT scanning is performed even when vital signs are not stable.
- (D) Contrast examinations are not carried out.
- (E) Exposure needs not to be taken into account.

Q85. Select the correct statement regarding scanning of limbs.

- (A) The scab target should be positioned close to the center of the gantry.
- (B) Screws in bone do not cause artifacts.
- (C) VR is not necessary because diagnosis is carried out using MPR
- (D) Scanning of the hip joint should be done with as much dose as possible because the body is thick.
- (E) Images under soft tissue conditions are not necessary when observing a bone.

Q86. Select the correct statement regarding scanning using a dual energy CT.

- (A) This is a scanning method using a single X-ray tube voltage.
- (B) This method uses five reference materials to distinguish matter.
- (C) Two projection data should be scanned by minimizing spatial and temporal errors.
- (D) The method improves SD in virtual monochromatic X-ray images of low energy components.

(E) The method improves contrast in virtual monochromatic X-ray images of high energy components.

Q87. Select the wrong statement regarding clinical application of dual energy CT.

- (A) Ureteral calculus analysis
- (B) Iodine mapping
- (C) Automated bone removal
- (D) Virtual simple CT image
- (E) Virtual contrast CT image

Q88. Select the correct statement regarding CT urography.

- (A) Scanning is performed on the dorsal position.
- (B) Scanning time after making contrast is irrelevant.
- (C) Differences between individuals do not contribute to images in CTU.
- (D) MIP processing is to be conducted.
- (E) Scanning after a dynamic exam is difficult.

Q89. Select the correct statement regarding head CT perfusion.

- (A) Scanning is done with high voltage and high dose.
- (B) This exam is highly quantitative.
- (C) Abnormal recirculation zones do not appear in images before ischemic change.
- (D) Special care is necessary regarding exposure dose.
- (E) Image analysis is not affected by noise.

Q90. Select the correct statement regarding biopsy using head CT.

- (A) It is useful in early diagnosis of tumors.
- (B) Exposure of the practitioner is not a problem.
- (C) It is not possible with a single CT.
- (D) The exposure dose needs not to be considered.
- (E) A thinner scanning cross-section is always better.