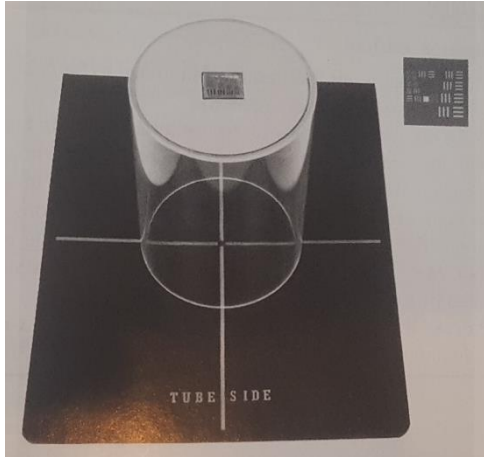


# 2016MRSM

1. What is the purpose of these tools in quality measurement of diagnostic X-ray generator?



- a) Timer accuracy
- b) Focal spot test
- c) Resolution test
- d) mAs reciprocity

2. The minimum HVL for x-ray units operating at 80kVp, 50mAs is -----mm of aluminium

- a) 1.3
- b) 1.8
- c) 2.3
- d) 2.8

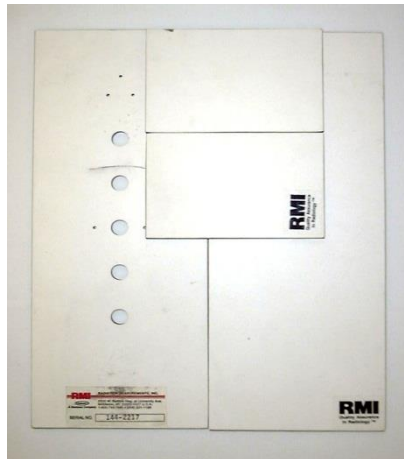
3. The maximum variability allowed for the reproducibility of exposure at 80kVp, 10mAs is  $\pm$  ----- %

- a) 5
- b) 10
- c) 15
- d) 20

4. Which of the following is the right answer about Exposure Dose in SI unit (International system of units)?

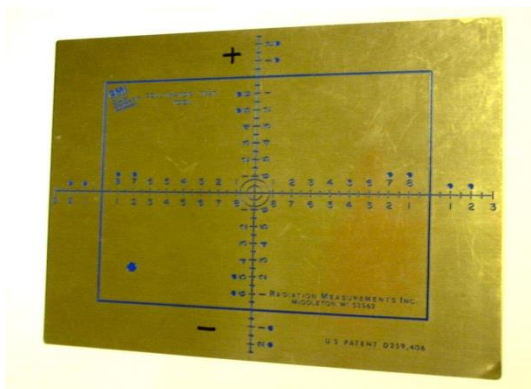
- a) R (Roentgen)
- b) Gy (Gray)
- c) Sv (Sivert)
- d) C/kg (Coulomb/kilogram)

5. What is the purpose of these tools in quality measurement of diagnostic X-ray generator?



- a) Collimator test
- b) Grid alignment test
- c) Beam alignment test
- d) Half Value Layer test

6. What is the purpose of these tools in quality measurement of diagnostic X-ray generator?



- a) Focal spot test
- b) Grid alignment test
- c) Low - contrast test
- d) Beam – Light field test

7. Which of the following is correct explanation of improve matter in image when using grid?

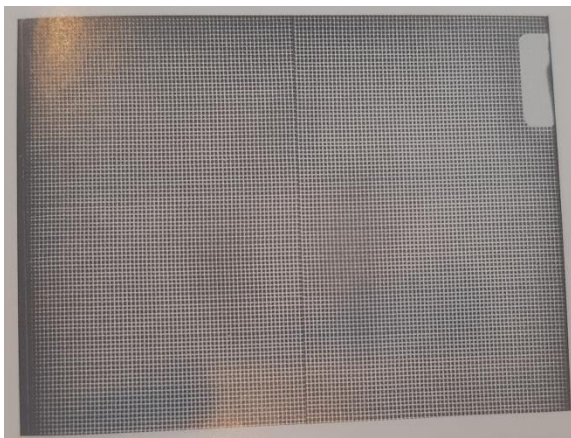
- a) Contrast
- b) Latitude
- c) Sharpness
- d) Resolution

8. What is the purpose of these tools in quality measurement of diagnostic X-ray generator?



- a) Tube kilovolt
- b) Exposure time
- c) Exposure dose
- d) Auto exposure control

9. What is the purpose of these tools in quality measurement of diagnostic X-ray generator?



- a) Grid alignment test
- b) Low - contrast test
- c) High - contrast test
- d) Screen-Film contact test

10. What is the purpose of these tools in quality measurement of diagnostic X-ray generator?



- a) Area dose
- b) Absorbed dose
- c) Exposure dose
- d) Entrance skin dose

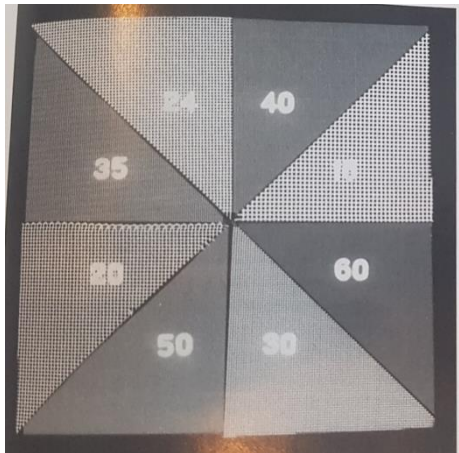
11. How much is the limitation of leakage dose of X-ray tube in the distance of 1 m?

- a) 10 mR/min
- b) 10 mR/hr
- c) 100 mR/min
- d) 100 mR/hr

12. How much is the absorber thickness for resolution pattern using in fluoroscope?

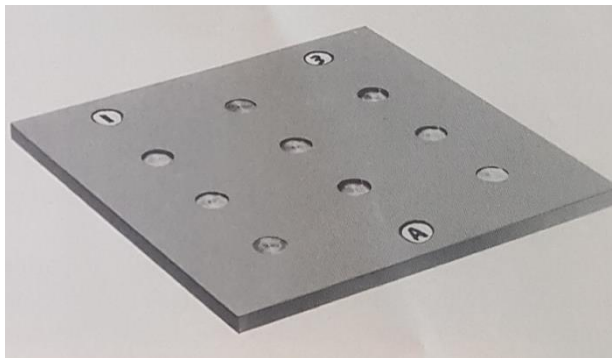
- a) 0.01 mmPb
- b) 0.05 mmPb
- c) 0.1 mmPb
- d) 0.2 mmPb

13. Which of the following measure using this phantom in fluoroscopy?



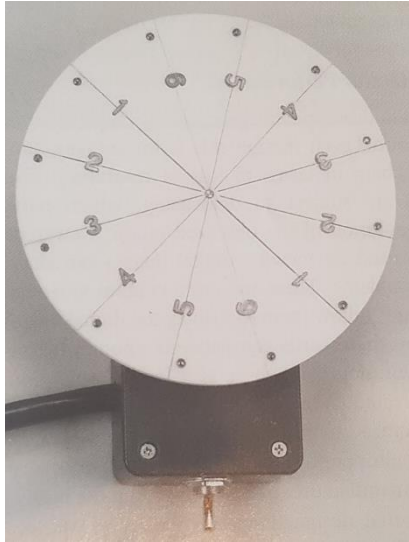
- a) Video monitor test
- b) Image distortion test
- c) Low - contrast resolution test
- d) High - contrast resolution test

14. Which of the following measure using this phantom in fluoroscopy?



- a) Image enhancement test
- b) Low - contrast resolution test
- c) High - contrast resolution test
- d) Dual energy X-ray absorptiometry test

15. When using this measuring device in interventional equipment, what is the RPM?



- a) 30 rpm
- b) 60 rpm
- c) 90 rpm
- d) 120 rpm

16. How much is the limitation of maximum value of Entrance Exposure Rate(EER) in the device equipped with AEC?

- a) 1 R/min
- b) 5 R/min
- c) 10 R/min
- d) 100 R/hr

17. What is reasonable SID(Source-Image receptor Distance) in Mammography?

- a) 55 cm
- b) 65 cm
- c) 75 cm
- d) 80 cm

18. Which of the following test is true with a main purpose that is the bad pixel verification at an item of weekly check in quality management of DR mammography?

- a) MTF
- b) DQE
- c) SNR & CNR
- d) FFT(Flat Field Test)

19. The reason why using a low kVp in mammography is to:

- a) Reduces contrast and reduces patient dose
- b) Increases contrast but increases patient dose
- c) Reduces contrast but increases patient dose
- d) Increases contrast and reduces patient dose

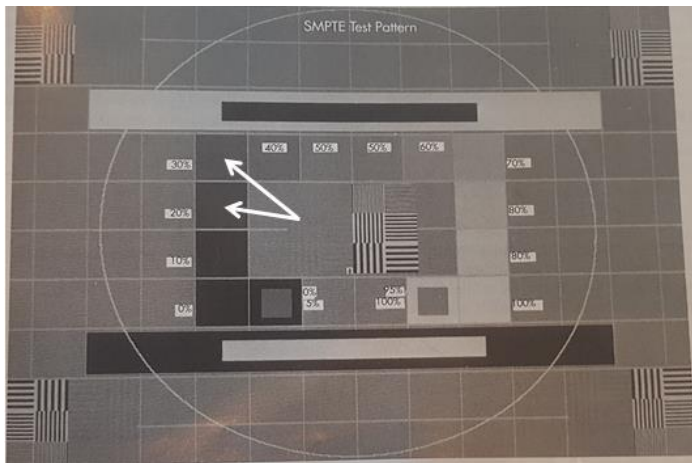
20. Which is right about the proper average glandular dose in one exposure for a mammography?

- a) 1.5mGy and below
- b) 2.0mGy and below
- c) 2.5mGy and below
- d) 3.0mGy and below

21. What is the usual range of force and time for mammographic system compression device?

- a) 11 to 22 lb and 30 sec.
- b) 22 to 44 lb and 1 min.
- c) 44 to 66 lb and 90 sec.
- d) 66 to 88 lb and 2 min.

22. What is the purpose of the directions in the image?

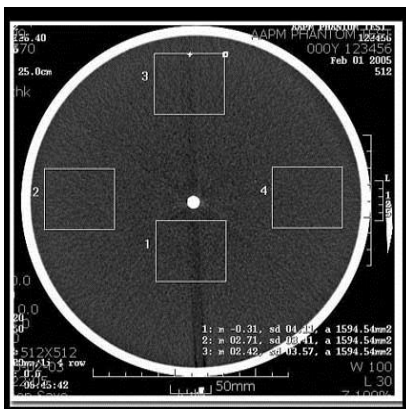


- a) Gray scale steps
- b) Contrast resolution
- c) Uniform background
- d) 5 % Contrast patches

23. Choose the item relevant to CT resolution in the axial direction.

- a) Scan time
- b) Helical pitch
- c) Display pixel size
- d) Detector sensitivity

24. What is this CT image for?



- a) Linearity
- b) Uniformity
- c) CT number
- d) Slice thickness



25. Choose the correct statement about Multi-slice CT.

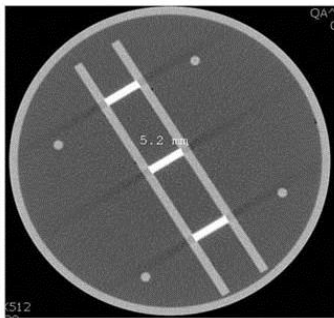
- a. RF coil
- b. Electric wave shield
- c. Cone beam
- d. DAS(Data Acquisition System)
- e. STC (Sensitivity Time Control)

- a) a, b      b) a, e      c) b, c      d) c, d

26. Which of the following is correct standard range when using 250mAs in CT equipment QC?

- a)  $\pm 10\%$
- b)  $\pm 15\%$
- c)  $\pm 20\%$
- d)  $\pm 25\%$

27. What is this CT image for?



- a) Noise
- b) Artifact
- c) Uniformity
- d) Slice thickness

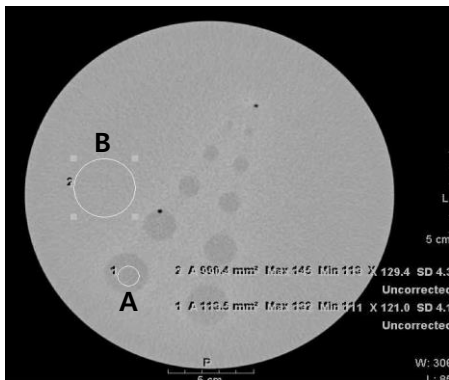
28. Which effect is true about inhomogeneity of CT number from characteristics of X-ray in an object in Computed Tomography?

- a) Photon effect
- b) Cupping effect
- c) Partial volume effect
- d) Beam hardening effect

29. In phantom image exam of CT equipment, What is the standard range of CT number and Noise?

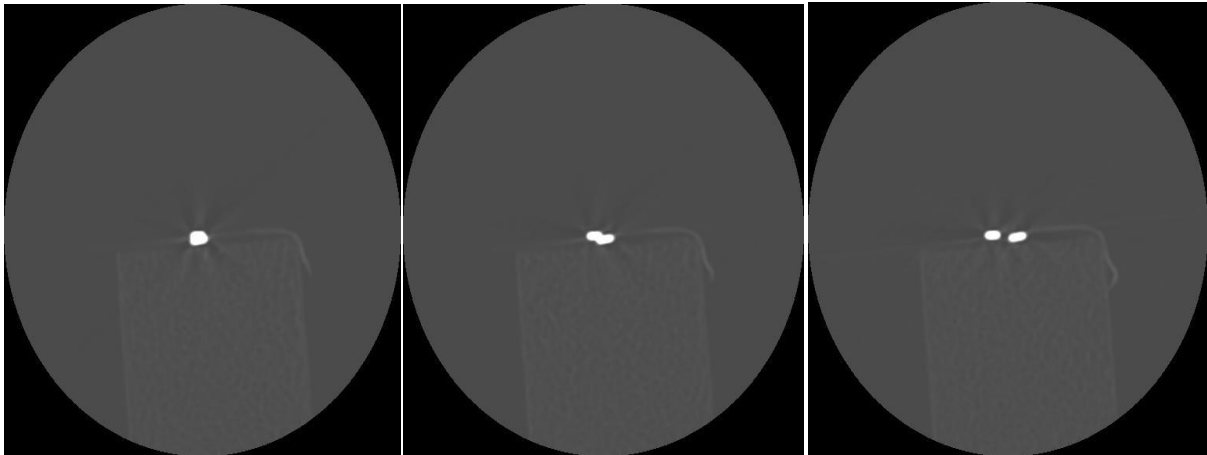
- a)  $0 \pm 7$  HU below, 7 HU below
- b)  $0 \pm 10$  HU below, 8 HU below
- c)  $0 \pm 5$  HU below, 10 HU below
- d)  $0 \pm 7$  HU below, 10 HU below

30. How much difference has CT number between A and B at the image for the contrast resolution?



- a) 10 HU
- b) 15 HU
- c) 30 HU
- d) 50 HU

31. Which of the followings can be estimated from the below images?



- a) Accuracy of the location image
- b) Patients dose measurement test
- c) Accuracy test of the table movement distance
- d) Evaluation of comparison between the measured value and the real value

32. Choose the correct statement about a Superconducting magnet MRI system.

- a) A Static magnetic field not remains when power to the MRI system is shut off.
- b) The Gradient magnetic field coil must also be maintained in a Superconducting state.
- c) The Static magnet field coil is cooled by liquid helium to maintain a Superconducting state.
- d) To cool down the heat of equipment, the huge capacity of cooling water supply system is needed.

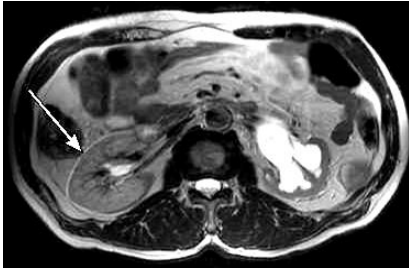
33. Choose the correct action to be taken in advance of a power system maintenance outage in an area including an MRI examination room.

- a) In the case of a Resistive magnet MRI system, keeping the power to the Static magnetic field coil is not related with eliminating the magnetic field.
- b) In the case of a Permanent magnet MRI system, sudden change in temperature in the examination room is not related with magnetic field.
- c) In all types of MRI systems, because the Static magnet field disappears during an outage, there is not need to prohibit access to the MRI examination room.
- d) In the case of a Superconducting magnet MRI system, because helium consumption increases when the refrigerator stops, add a sufficient amount of helium to avoid the occurrence of quenching.

34. What is the recommended and prohibited Gauss line for those patients who are transplanted a peace maker at MRI room?

- a) 0.5
- b) 5
- c) 10
- d) 50

35. Which of the following is correct about MRI Chemical Shift Artifact?



- a) Chemical shift artifact occurs in the border plane of air and fat.
- b) Chemical shift artifact occurs in the direction of frequency encoding.
- c) Reducing Chemical shift artifact is possible by making Receive bandwidth.
- d) Reducing Chemical shift artifact is possible with Fat suppression method.

36. What is the limitation range of SAR that is exposed to RF? (Counseled from AFDA)

- a) 0.4 W/kg
- b) 0.8 W/kg
- c) 4.0 W/kg
- d) 8 W/kg

37. Following are the statement of Gauss line. Which composition that can be effected from MRI equipment is correct?

- a) 1 Gauss line – Watch
- b) 5 Gauss line – Film developer
- c) 5 Gauss line – Pacemaker
- d) 10 Gauss line – Each kind of tools

38. England, in 1983, National Radiological Protection Board(NRPB) had published “Exposure of Electric-magnetic field in MRI imaging for pregnant woman”, and it suggested the period to avoid the examination. Which following period is correct?

- a) Early pregnancy
- b) 3 months – 6 months
- c) 6 months – Prior to delivery
- d) Early pregnancy – until 3months

39 The next figure is an extremely low temperature cooler that is a part of the support system in MRI equipment. Choose the right answer about this equipment.



- a) Water cooling
- b) Water pressure controlling
- c) Maintenance of temperature in magnet
- d) Maintenance of temperature in computer room

40. The acoustic noise from MRI equipment is caused by repetitive interaction of electro-magnetic field and gradient magnetic field. This phenomenon causes accidental loss of hearing by reason of big and short noise. How much level is maximum sound pressure (dB)?

- a) 70 dB
- b) 95 dB
- c) 100 dB
- d) 140 dB

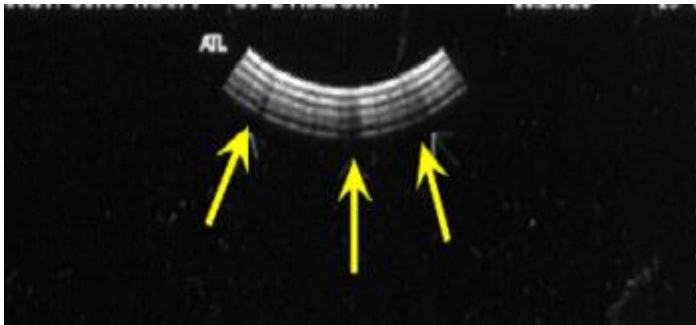
41. Which of the following is incorrect in ultrasonography?

- a) The probe should not be folded a cable forcibly.
- b) The device should be avoided the region nearby strong electromagnetic field.
- c) The device should be unplugged with certain confirmation of the image transferring for moving.
- d) Freezing image is unnecessary when there is time interval between recent and next examination.

42. Which of the following is incorrect for the quality management of device?

- a) It is the activity for maintenance the uniformity of image quality always.
- b) It can reduce a time for repeated examination and the maintenance of device.
- c) It can find the changes from the deterioration of the device quality and general aging.
- d) The measuring activity is needed for optimization of capacity of the device when breakdown or some problem is occurred only.

43. This image is about the inspection for transducer. Which of following cannot be said about this?



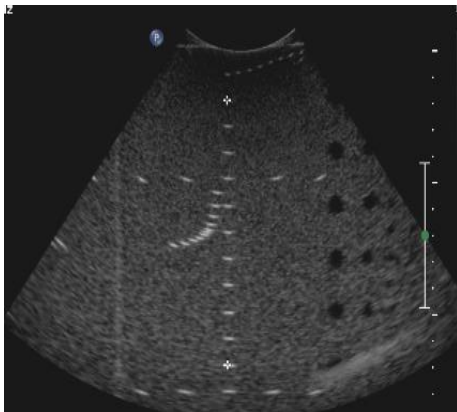
- a) Freeze after examination
- b) Must check if there is a crystal defect
- c) Heat sterilize for the disinfection of probe
- d) Must check if there is a little empty space between probe and rubber

44. Which of the followings causes the below artifact?



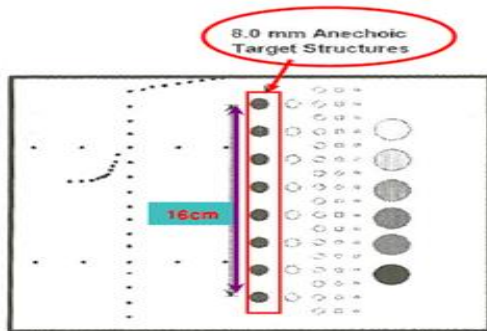
- a) Dirty air filter
- b) Damaged acoustic lens
- c) Damaged cover of the probe
- d) Unstable power voltage supply

45. Which of the following is incorrect for the indicated region of target image in standard phantom?



- a) The distance between targets must be below  $1.0 \pm 1$  cm.
- b) It should be measured 1st to 11th point because it takes a lot of time for distance measurement of each point.
- c) We should measure every focus as possible, and place the vertical line target at the center of the image
- d) Above is an assessment of 'Vertical Measurement', and is acquired in vertical condition to the Beam Axis. Purpose is to measure how accurately consistent with the acquired value, and the measured plane is Surface #1.

46. Which of the following is correct for the item which can be measured using 8mm anechoic target from the below image?



- a) Resolution: The ability of distinguishing two neighboring objects
- b) Dead zone: The distance from the front of transducer to the echo that can be found firstly
- c) Sensitivity: The ability that can be found and visualized the weak echo of small object which is placed at the specific depth
- d) Focal Zone: Provision the most accurate diagnostic information with the region that is maximum intensity and lateral resolution nearby the focal point

47. Which of the following is not concerned with receiver function?

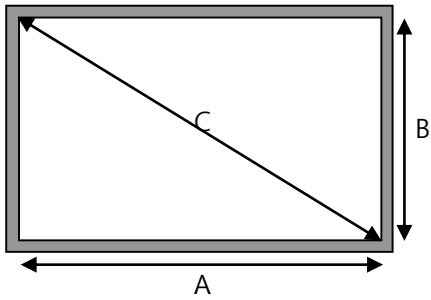
- a) Rejection
- b) Converting to TV signal
- c) Amplification (gain)
- d) Compensation (T.G.C)

48. Which of the following does not need the regular quality management in ultrasonography?

- a) Distance
- b) Uniformity
- c) Axial resolution
- d) Maximum depth of visualization



49. What is the size of monitor in this image?



- a) Length of C
- b) Length of  $A \times B$
- c) Length of  $A + B$
- d) Length of  $A + B + C$

50. What is this test for?



- a) Virus Checking
- b) Server Checking
- c) Monitor Calibration
- d) Illuminator Calibration