

Name

Hajira

I.D

15304

Mam = Maheen

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Q1. Describe the features of Pre-processing and Post-processing.

Ans. Pre-processing:

Pre-processing of digital images is largely automatic.

⇒ Pre-processing are following

Problem	Solution
• Defective Pixel	• Interpolate
• image lag	• adjection Pixel
• line noise	• Signals ⊙
	• effect correction
	• correction from dark reference zone.

⇒ Pre-processing is designed to produce artifact-free digital images. In this regard Preprocessing provides electronic calibration to reduce Pixel-to-Pixel row

(2)

row-to-row, and Column
to Column response, differences,

⇒ the Processes of Pixel
Interpolation, lag correction,
and noise correction are
automatically applied with
most system

Post-Processing,

⇒ Post Processing of digital
image requires operator
manipulation.

Process . Result.

- Annotation
- label the image
- Window and level
- expand the
digital gray scale
to visible.
- magnification
- improve visualization
and Spatial
resolution
- Image flip
- Rearranging image
presentation

(3)

- Image Inversion • make white-black and black white
- Subtraction (DSA) • improve image contrast
- Pixel Shift • Reregister an image to correct for patient motion
- Region of interest • Determine average image for use in quantitative image

⇒ Post processing is where digital imaging shines. In contrast to Pre-processing which largely automatic, postprocessing require intervention by the radiologic Technologist and Radiologist. Post-Processing refers to anything that can be done to a digital radiographic image after it is acquired

(4)

by the imaging system.
⇒ Postprocessing of the digital radiographic image is performed to optimize their appearance of the image for the purpose of detecting pathology.

Q 2) Distinguish between Spatial resolution and Contrast resolution.

Ans

Spatial resolution

Spatial resolution (resolution and space) is the ability of an imaging system to resolve and render on the image a small high contrast object.

= (Spatial resolution is the render small object on the image

(5) Contrast Resolution.

⇒ Contrast Resolution is the ability to distinguish many shades of gray from black to white. All digital imaging systems have better contrast resolution than screen film imaging.

Q3: Discuss the characteristic of digital imaging that should in lower patient radiation dose

Ans Dose Reduction with Digital Radiographic.

- Exposure should not be repeated in digital radiography (DR) because of brightness or contrast concerns.
- DR system cannot compensate for excessive noise caused by quantum mottle.
- overexposed images do not have to be repeated and should not

(6)

become a habit.
⇒ With acceleration to all digital imaging, we have the opportunity to reduce patient doses by 20% to 50% depending on the examination. However, quite the opposite often has occurred - something that many call

⇒ Because digital imaging can always give good images.

Q 4) Discuss the features of active matrix liquid crystal display,

Ans liquid crystal display.
(LCDs)

An active liquid crystal display (AMLCD) is a type of flat plate display, the only viable technology for high-resolution TVs, computer monitors

note book Computers . tablet
 Computers and Smartphone
 with an LCD screen,
 due to low weight, very
 good image quality, wide
 color gamut and response
 Time.

Q5: Identify application of the
 Picture archiving and
 Communication System.
 Picture.

A Picture archiving
 and Communication System (PACS)
 when ~~is~~ fully implemented
 allows not only the
 acquisition but also the
 interpretation and storage of
 each medical image in
 digital form without
 resorting to film (hard copy)
 (PACS improve image,
 interpretation, processing and
 result)

Q 6) Discuss the three types of digital radiographic image artifacts and how to avoid them? (8)

Ans • motion artifacts occur due to movement of patient.
Correction.

We correct this artifact when immobilize the patient.

• Subject artifact.

artifact can arise from the Technologist error in Patient positioning, x-ray beam collimation and histogram selection.
Correction

We correct this artifact the proper Patient Positioning x-ray beam collimation histogram selection

metal artifact.

artifact occur due to metal
metallic object present with
Patient.
Correction.

metal artifact
can be corrected by
removing such object from
the patient.

Q7 Describe the basic from
data compression and the
and the difference between
lossless and lossy compression.

Ans data compression

The major diff
is def.

Data compression is
a method of lessening
the size of the size of
the data without
significant loss of information.

⇒ Difference between lossy and lossless compression

The major difference between lossy compression and lossless compression is that lossy compression produces a close match of the data after decompression but it creates exact original data.

Q 8) Identify the difference between 'for processing' image and 'for presentation' image.

Ans Before an image is prepared for "processing" several manipulations of the output of an image receptor may be necessary to correct for potential artifacts. Such artifacts

⇒ A single pixel with

Row or column normally will not interfere with diagnosis. Correction algorithms specific to each type digital image receptor interpolation technique to assign digital values to each dead pixel, row, column.

Q9) Explain how digital radiographic image artifact occurs because collimation, position, or alignment.

Ans Collimation and Position the x-ray exposure field is not properly collimation sized and position, exposure field recognition error may occur. because signal outside the exposure field included in the histogram. the result is very dark or very light or very noisy image.

- ⇒ Automatic radiation field recognition is essential for artifact-free images.
- ⇒ Proper collimation and centering prevent histogram errors that can lead to artifacts.
- ⇒ Partitioning of multiple images on a single IP image result in proper and collimation of each image.
- Alignment.

Alignment of the exposure on the IP is important in the same way reason as collimation.

- ⇒ Where not oriented with the size and dimension of the IP, image artifact can appear.