Answer No: 1

Preproccessing :→

PrePrOcessing of the digital images is largely automatic.

➡ PrePrOcessing action are outlined. PrePrOcessing is designed to PrOduce artifact-free digital images.

➡ In this regard, PrePrOcessing PrOvides electronic calibration to reduce Pixel-to-Pixel, row-to-row, and column-to-colum differences.

➡ The PrOcesses of Pixel interPolation, leg correction, and noise correction are automatically applied with most systems.

➡ Gain image are generated every few months, and offset images are generated many times each day.

➡ The Solution is to apply a voltage correction from a row or a column of Pixels in a dark, unirradiated area of the image receptor.

b part :-

Postprocessing :-

Postprocessing is where digital imaging shines.

⇒ In contrast to preprocessing, which is largely automatic post-processing requires intervention by the radiologic technologist and the radiologist.

⇒ Postprocessing of digital images requires operator manipulation.

⇒ Annotation is the process of adding text to an image

⇒ Digital images have dynamic ranges up to 16-bit, 65,536-gray levels.

⇒ The human visual system can visualize only approximately 30 shades of gray.

⇒ By window and level adjustment, the radiologic technologist can make all 65,536 shades of gray visible.

⇒ This amplification of image contrast is the most importance feature of

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digital radiographic image.
⇒ Edge enhancement is effective for fractures and small, high-contrast tissues.
⇒ Highlighting can be effective in identifying diffuse, nonfocal disease
Pan, scroll, and zoom allow for careful visualization of precise regions of an image.

Answer No: 02

Spatial Resolution:-

⇒ Spatial Resolution is the ability to image small structures that have high subject contrast such as bone-soft tissue interface.
⇒ When all of the factors are correct, conventional radiography has excellent spatial resolution.

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Contrast Resolution :-

⇒ Contrast Resolution is the ability to distinguish structures with similar subject contrast such as liver - spleen, fat - muscle.

⇒ Computed tomography and MRI have excellent contrast resolution Conventional radiography is fair to poor.

Answer No: 03

Characteristic of Digital imaging :-

⇒ A Digital image is made of a 2D arrang of number called a matrix

⇒ A Digital image has four basic charactestic or fundamental Parameters Matrix, Pixel, voxels and bit Depth

① Pixel :-

A Pixel or Picture element, is smallest element in a digtal image. If you have ever magnified a digtal picture to the Point that you

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See the image as small squares of color, spatially, the digital image is seperatal into Pixels with discrete. The process of associating the pixels with dicreate values defing maximum Contrast Resolution.

Matrix :-

A matrix is a square arrangment of number in columns and rows, and in digital imaging, the number coroespond to discrete Pixal values.

⇒ A Digital image is a matrix of many small elements, or Pixels.

⇒ The advantege of Digital images is that they can be processed inmany ways. by computer system.

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Result in lower Patient Dose:-

⇒ All Digital imaging, we have the opportunity to Reduce Patient Doses by 20% to 50% Depending on the Examination.

⇒ Digital imaging can always yield a good image, it is possible for the Radiologic technologist to be unwitting lured into not adjusting exposure as frequently as with screen film

b Part:-

⇒

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Answer No: 04

Liquid Crystal Display:-

⇒ A liquid crystal has the property of highly ordered molecular structure a-crystal and the property of viscosity -a fluid.

⇒ Liquid crystal materials are linear organic molecules that are electrically charged, forming a natural molecular dipole.

⇒ Consequently, the liquid crystals can be aligned through the action of an external electric field.

Features:-

⇒ Liquid crystal displays are fashioned Pixel by Pixel.

⇒ The LCD has a very intense white backlight the illuminates each Pixel.

⇒ The differences between color and monochrome LCDs involve the design of the filters and films.

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⇒ Medical flat Panel digital display devices are monochrome LCDs.

Answer No: 05

Application :-

⇒ A Picture archiving and Communication system allows not only the acquisition but also the interpretation and Storage of each medical image in digtal form without resorting to film.

⇒ It is a medical imaging technology used primarily in healthcare organizations to securely store and digtally transmit electronic images and clinically relevant reportes.

⇒ It allows for image interpretation remotely.

⇒ It is used by radiology Personnel to manage workflow of patient exams.

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Answer No: 06

3- TYPES OF ARTIFACTS

(1) Image receptor Artifacts :-

- ⇒ Dust
- ⇒ Dirt
- ⇒ Scratches

(2) Software Artifacts :-

- ⇒ Histograms
- ⇒ Range / Scaling
- ⇒ Image compression

(3) Object Artifacts :-

- ⇒ Patient positioning
- ⇒ Collimator / Partition
- ⇒ Back Scatter

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Answer NO: 07

(b) Lossless Compression

⇒ "It creates the exact original data".

⇒ "No data is lost here"

Lossy Comp..

⇒ "It produces a close match of the data after decompression"

⇒ "Some data is lost in it".

(a) Data Compression :-

⇒ "It is a method of lessening the size of data without significant loss of information".

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Answer No: 09

Object artifacts:-

⇒ object artifacts can arise from the technologists errors in Patient Positioning, X-ray beam Collimation, and histogram Selection.

⇒ Backscatter radiation also can be troublesome because of the sensitivity of the digital radiographic image receptor.

Collimation and Partition:-

⇒ If the x-ray exposure field is not Properly Collimated, Sized, and Positioned, exposure field recognition errors may occur.

⇒ These can lead to histogram analysis errors because signal outside the exposure field is included in the histogram.

⇒ The result is very dark or very light or very noisy images.

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Answer No: 08

For Processing image:-

⇒ It is a digital set representing an image, which can be processed and passed for presentation.