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Question-1

Answer.

Features of Preprocessing

Preprocessing of digital images is largely automatic

Preprocessing is designed to produce artifact-free digital images.

Preprocessing provides electronic calibration to reduce pixel to pixel, row to row and column to column response differences.

Scaling is one of the main ² components of data preprocessing and can be applied to all types of data one might come across.

Preprocessing is the most important step in data mining.

- Numerical features.
- Categorical and ordinal features.
- Data and time.
- Text.
- Image.

Features of Postprocessing

The postprocessing features:

- Annotation is the process of adding text to an image.

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

- Postprocessing of digital

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images requires operator
manipulation.

- The larger matrix size digital display devices have better spatial resolution because they have a smaller pixels.
 - Edge enhancement is effective for fractures and small, high-contrast tissues.
-

Question. 2

Answer

Spatial resolution	Contrast resolution
Spatial resolution is the ability of an imaging system to resolve and render the image a small high-contrast object.	Contrast resolution is the ability to distinguish may shades of gray from black to white.
Spatial resolution losses occur because of blurring caused by geometric factors.	The contrast of an image is affected by the properties of the receptor used to form the image.
Spatial frequency is expressed in line pairs per millimeter.	Contrast frequency expressed in μrad .
Spatial resolution remains the same.	Contrast resolution is improved at higher mAs.
The spatial resolution of CT is excellent	The contrast resolution of CT is not

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and the primary
strength of modality.

intrinsically
high.

Question: 3

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Answer:

Characteristics of Digital imaging :

A digital image begins as an analog signal. The image becomes digitized and is sampled multiple times.

The critical characteristics of digital image are spatial, contrast, noise and dose efficiency.

Matrix : A matrix is a square arrangement of numbers in columns and rows and in digital imaging the numbers correspond to discrete pixel values.

Contrast resolution is the important characteristics in analog and digital imaging.

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• fundamental parameters:
matrix, pixels, ~~voxels~~ voxels
and bit depth.

Pixels: A pixel is the
smallest picture element
of a digital image.

A monochrome pixel can
have two values, black
or white/0 or 1. color
and gray scale.

Question-4

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Answer

Features of active

matrix liquid crystal display:

An active-matrix liquid crystal display (AMLCD) is a type of flat panel display, the only viable technology for high-resolution TVs, computer monitors, notebook computers, tablet computers and smartphones with an LCD screen, due to low weight, very good image quality, wide color gamut and response time.

Question-5

Answer:

Picture Archiving and
Communication system:

Radiology is adopting digital imaging at the expense of analog images on film.

Estimates of the present level of digitally acquired images range upto 70%. These image come from nuclear medicine, digital ultrasound, DR, DF, CT and MRI. Analog images, such as conventional radiographs, also can be digitized.

Film digitizers are based on laser beam technology.

A picture archiving and communication system (PACS) when fully implemented, allows not only the acquisition but also the interpretation and storage of each medical image on digital

form without resorting to film. 10
The projected savings in time and money are enormous.

The three principal components of PACS and display system, the network, and the storage system.

Question-6

Answer:

Three types of digital radiographic imaging artifacts:

1: Processing Artifacts

- Emulsion pickoff.
- Gelatin buildup.
- Costain effect.
- Chemical fog.
- Guide - sho marks.
- P_r lines.
- Wet pressure sensitization.

2: Exposure Artifacts

- Motion.
- Improper patient position.
- Wrong screen-film match.
- Poor screen contact.
- Double exposure.
- ~~Wet~~ Waxed cassette.
- Improper grid position.

3: Handling and Storage artifacts

- Light fog.
- Radiation fog.
- Static.
- Kink marks.
- Hypo retention stain.
- Scratches.

Answer:

"DATA Compression":

Data compression takes advantage of redundancy of data, as occurs with exposure to x-ray beam when all values are the same.

Such compression techniques are described as lossless or lossy.

Lossless Compression:

Reduced the data file to 10% to 50% of the original file. However this is not satisfactory for large image files b/c transmission time and data manipulation time can still be unacceptable.

Lossy Compression:

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can provide compression factor upto 100:1 or greater, can be used on image

Question-8

Answer:

Processing image:

These images are manipulated into form presentation image that can then be used by the used tech for Qc.

Presentation image:

These images are used for Qc by the used tech and are interpreted by Radiological.

Question-9

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Answer:

Exposure Artifacts:

Exposure artifacts are usually easy to detect and correct. They are generally associated with the manner in which the radiographer conducts the examination. Incorrect screen-film match, poor screen-film contact, warped cassettes and improper positioning of grid can all lead to artifacts. Improper patient position, patient motion, double exposure and incorrect radiographic technique can result in poor images that may be considered to have artifacts. Such poor technique results in the largest number of repeat examination. Improper preparation of the patient immediately before exposure can lead to disturbing artifacts such as

the jewelry, eyeglasses and other items. These artifacts could easily have been prevented.
