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Q1: What is Grey Level Slicing?  
Explain in your own words  
with suitable examples

Ans: GREY SLICING:-

IT is also known as intensity slicing. We take a band of grey levels and display it. So for example we need to find a flaw in city scan we use a grey level slicing in which we can see a specific range of grey level values. There are two methods of slicing

- ① with background and
- ② without background.

b) Is it possible to get additional details in the Negative of a picture?

Ans In negative picture the lightest areas of the photographed subject appears darkest and the darkest areas appear lightest. So No, we can not see additional details, we cannot see colors, we cannot identify objects etc. For example:  
We take a <sup>negative</sup> picture of a tree we cant see its leaves colors nor can we identify which type of tree is it (plum, orange, mango, etc).

Q2) ~~The~~ What enhancement techniques might be applied to get this output? Explain in your words.

Ans) The following are the enhancement techniques used for the output image:

1) Histogram Equalization:-

Used to improve the contrast in image stretching out the intensity range of the image.

2) Linear contrast adjustment:-

increase the contrast level and brightness level of an image.

3) Median filtering:-

This is a non-linear digital filtering technique often used to remove noise from an image or signal.

4) Unsharp mask filtering:-

It adjusts the contrast of the edge detail and creates the illusion of a more focused image.

Q3: Find the Following for the points 'p' and 'q'

- Euclidean Distance.
- City Block Distance.
- Chessboard Distance.

Sol:  $P \Rightarrow (x, y) = (6, 1)$

$Q \Rightarrow (s, t) = (3, 7)$

Euclidean Distance:-

$$\begin{aligned} \Rightarrow D_e(P, Q) &= \sqrt{(x-s)^2 + (y-t)^2} \\ &= \sqrt{(6-3)^2 + (1-7)^2} \\ &= \sqrt{(3)^2 + (-6)^2} \\ &= \sqrt{9 + 36} \Rightarrow \sqrt{45} \text{ Ans} \end{aligned}$$

City Block Distance:-

$$\begin{aligned} \Rightarrow D_4(P, Q) &= |x-s| + |y-t| \\ &= |6-3| + |1-7| \\ &= 3+6 = 9 \text{ Ans} \end{aligned}$$

Chessboard Distance:-

$$\begin{aligned} \Rightarrow D_8(P, Q) &= \max(|x-s|, |y-t|) \\ &= \max(|6-3|, |1-7|) \\ &= \max(3, 6) \\ &= \max(6) \\ &= 6 \text{ Ans} \end{aligned}$$

Q4) What does a Histogram of an image shows? How is it useful for processing an image?

Ans) Histogram acts as a graphical representation of the tonal distribution in a image. If we look at a image a viewer will be able to judge the entire tonal distribution at a glance. Well, In digital image processing the histogram is used for graphical representation of a digital image. Nowadays image histogram is present in digital cameras. Photograph use these to see the distribution of tones captured.

(b) Match each picture with its possible histogram:

Ans) Pic a : Hgm 2

Pic b : Hgm 1

Pic c : Hgm 4

Pic d : Hgm 3