

**IQRA NATIONAL UNIVERSITY**

**FINAL TERM PAPER**

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## Q # 1(a)

What is Grey Level Slicing?  
Explain in your own words with suitable example.

## A # 1(a)

## GREY LEVEL SLICING:-

Grey Level Slicing manipulates groups of intensity levels in an image upto specific range by diminishing rest or by leaving them alone.

It is applicable in medical images and satellite images such as X-rays and C-T scan.

e.g.;

It brightens and darkens the dusk and dawn images. It improves images for sandstorm environments. If a picture is in grey and white, so the grey area can be whiten by applying this technique.



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## Q # 1(b)

It is possible to get additional details in the Negative of a picture. Justify your answer with suitable example.

## A # 1(b)

Negative of an image is a total inverter in which light areas appear dark. A negative color image is additionally color reserved. Negative image has basically details in it but they are reserved in the film they are opened on the photographic page.

Negative film usually have less contrast, but a wider dynamic range than the final printed positive images. The contrast typically increase when they are printed on photographic page. When negative films are brought into digital rim, their contrast can be adjusted at the time of scanning and by other processes.



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## Q.# 2

Consider the picture given below:

The image on the left side is input to some Image Enhancement System and the one on the right side is the output. What enhancement technique/s might be applied to get this output? Explain your answer in your own words.

## A # 2

In the given picture, it is enhanced by the histogram equalizer technique.

In histogram equalizer technique, the adjustment of contrast of the image takes place. This technique improves the image appearance by scaling out the intensity range of the image. Through the reassignment of pixel value, the distribution on the histogram is stretched out to produce a more uniform distribution.

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Q # 3

Find the following for the points 'p'  
& 'q' given on grid:

A # 3

### EUCLIDEAN DISTANCE:-

$$p(x, y) = (6, 1)$$

$$q(s, t) = (3, 7)$$

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

### CITY BLOCK DISTANCE:-

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

### CHESSBOARD DISTANCE:-

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



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Q# 4(a)

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

A# 4(a)

Histogram acts as a graphical representation of the tonal distribution in an image. If we look at an 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. Now-a-days, image histogram is present in digital cameras, photograph use these to see the distribution of tones captured.

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Q # 4(b)

Some pictures and their histograms are given below, but shuffled. Match each picture with its possible histogram. One of your answer sheet, if you think Pic a matches Hgm, 1, then write your answer as Pic a: Hgm 1.

A # 4(b)

Pic a : Hgm 2

Pic b : Hgm 1

Pic c : Hgm 4

Pic d : Hgm 3