definition

① Discuss the significance of sampling and quantization in processing of digital image (4).
② Discuss the importance of image pre-processing in understanding the Digital image dat. (4)
③. Justify image analysis and understanding in an useful task for better society building. (4)
④ Discuss the importance of biometric considering the current applications. (4)
⑤ Explain image representation. (4)

① ~~Sampling~~:

~~The Sampling rate~~

① In order to become suitable for digital processing an image function (say) must be digitized both spatially and in amplitude. Typically a frame grabber or digitizer is used to sample and quantize the analogue video signal. Hence in order to create an image which is digital. we need to covert continious data into digital form. There are two steps in which it is done

① sampling: ② quantization

Sampling: The sampling rate determine the spatial ~~result of~~ resolution of the digitized image, while the quantization level determine the no. of grey levels in the digitized image. ~~Aug~~ A magnitude of the sampled image is expressed as a digital value. in image processing: the transition b/w continious values of the image function and its digital equivalent is called quantization.

Quantization:

The no. of quantization levels should be high enough for human perception of fine shading details in the image. The occurence of false contours is the main problem in image which has been quantized with insufficient brightness levels

(2) Preprocesing involves operations on images at the lowest level of abstractions where both input and and output images are intensity images. The aim of pre-processing is an improvement of the image data that eliminates distortions or enhances some image features suitable for further processing. Image enhancement is the most appealing pre-processing techniques. Basically the idea behind enhancement techniques is to bring out detail that is obscured or simply to highlight certain features of interest in an image such as changing brightness & contrast etc.

(3) The useful of this image processing technology is seeing in many different fields covering medicine through remote sensing. The advance & wide availability of image processing hlw has further enhanced the usefulness of image processing. Some of the fields in which digital image processing is widely used are.

(1) Banking:- Typical tasks include document verification Person authentication Bankers cheque

analysis. How these tasks can be attached efficiently

③ Agriculture: The role of image processing for weed application detection & removal and other video exhibit how image processing based system is developed to classify the fruits based on the texture properties.

④ Security and Surveillance

Road traffic control involves directing vehicular and pedestrian traffic around a construction zone accident or other road disruption.

⑤ selecting a good representation is only part of the solution for transforming image data into a form suitable. for Succeeding processing Description also called feature extraction that deals with extracting attributes that results in some quantitative information of interest and are basic for discriminating one class of objects from another. The feature extraction techniques are devised to extract features of an image the extraction technique to extracts high level features are needed in order to perform classification of objects. under observation.

⑥ Biometrics :

It is common to have physical & behavioural characteristics to authenticate a person there are several sectors which adopt biometric based person authentication for secure transaction. airport, entry etc. The kind of biometric varies from face signature, palm-print can to speech & many more.

Biometrics - Authentication of a person

→ Banking

→ Airport

→ electronic voting

→ Defense sectors

→ secured transcations

The most common Biometrics are

→ fingerprint

→ Face

→ Iris

→ voice

→ Hand shape

→ 3D face

→ Retina