



# BRAINWARE UNIVERSITY

**Term End Examination 2021 - 22**

**Programme – Bachelor of Technology in Electronics & Communication Engineering**

**Course Name – Digital Image and Video Processing**

**Course Code - PEC-ECEL802B**

**( Semester VIII )**

**Time allotted : 1 Hrs.25 Min.**

**Full Marks : 70**

[The figure in the margin indicates full marks.]

## Group-A

(Multiple Choice Type Question)

1 x 70=70

*Choose the correct alternative from the following :*

- (1) Among the following image processing techniques which is fast, precise and flexible.
 

a) Optical	b) Digital
c) Electronic	d) Photographic
- (2) An image is considered to be a function of  $a(x,y)$ , where  $a$  represents:
 

a) Height of image	b) Width of image
c) Amplitude of image	d) Resolution of image
- (3) The range of values spanned by the gray scale is called:
 

a) Dynamic range	b) Band range
c) Peak range	d) Resolution range
- (4) Which gives a measure of the degree to which a pure colour is diluted by white light?
 

a) Saturation	b) Hue
c) Intensity	d) Brightness
- (5) A typical size comparable in quality to monochromatic TV image is of size.
 

a) 256 X 256	b) 512 X 512
c) 1920 X 1080	d) 1080 X 1080
- (6) What is the first and foremost step in Image Processing?
 

a) Image restoration	b) Image enhancement
c) Image acquisition	d) Segmentation
- (7) What is the next step in image processing after compression?
 

a) Wavelets	b) Segmentation
c) Representation and description	d) Morphological processing
- (8) How many number of steps are involved in image processing?
 

a) 10	b) 9
c) 11	d) 12

- (9) Which of the following step deals with tools for extracting image components those are useful in the representation and description of shape?
- a) Segmentation  
b) Representation & description  
c) Compression  
d) Morphological processing
- (10) in which step of the processing, assigning a label (e.g., "vehicle") to an object based on its descriptors is done?
- a) Object recognition  
b) Morphological processing  
c) Segmentation  
d) Representation & description
- (11) What role does the segmentation play in image processing?
- a) Deals with extracting attributes that result in some quantitative information of interest  
b) Deals with techniques for reducing the storage required saving an image, or the bandwidth required transmitting it  
c) Deals with partitioning an image into its constituent parts or objects  
d) Deals with property in which images are subdivided successively into smaller regions
- (12) To convert a continuous sensed data into Digital form, which of the following is required?
- a) Sampling  
b) Quantization  
c) Both Sampling and Quantization  
d) Neither Sampling nor Quantization
- (13) For a continuous image  $f(x, y)$ , how could be Sampling defined?
- a) Digitizing the coordinate values  
b) Digitizing the amplitude values  
c) All of the mentioned  
d) None of the mentioned
- (14) For a continuous image  $f(x, y)$ , Quantization is defined as
- a) Digitizing the coordinate values  
b) Digitizing the amplitude values  
c) All of the mentioned  
d) None of the mentioned
- (15) How is sampling been done when an image is generated by a single sensing element combined with mechanical motion?
- a) The number of sensors in the strip defines the sampling limitations in one direction and Mechanical motion in the other direction.  
b) The number of sensors in the sensing array establishes the limits of sampling in both directions.  
c) The number of mechanical increments when the sensor is activated to collect data.  
d) None of the mentioned.
- (16) How is sampling accomplished when a sensing array is used for image acquisition?
- a) The number of sensors in the strip establishes the sampling limitations in one image direction and Mechanical motion in the other direction  
b) The number of sensors in the sensing array defines the limits of sampling in both directions  
c) The number of mechanical increments at which we activate the sensor to collect data  
d) None of the mentioned
- (17) The quality of a digital image is well determined by \_\_\_\_\_
- a) The number of samples  
b) The discrete gray levels  
c) All of the mentioned  
d) None of the mentioned
- (18) Let  $Z$  be the set of real integers and  $R$  the set of real numbers. The sampling process may be viewed as partitioning the  $x$ - $y$  plane into a grid, with the central coordinates of each grid being from the Cartesian product  $Z^2$ , that is a set of all ordered pairs  $(z_i, z_j)$ , with  $z_i$  and  $z_j$  being integers from  $Z$ . Then,  $f(x, y)$  is said a digital image if:
- a)  $(x, y)$  are integers from  $Z^2$  and  $f$  is a function that assigns a gray-level value (from  $Z$ ) to each distinct pair of coordinates  $(x, y)$   
b)  $(x, y)$  are integers from  $R^2$  and  $f$  is a function that assigns a gray-level value (from  $R$ ) to each distinct pair of coordinates  $(x, y)$   
c)  $(x, y)$  are integers from  $R^2$  and  $f$  is a function that assigns a gray-level value (from  $Z$ ) to each distinct pair of coordinates  $(x, y)$   
d)  $(x, y)$  are integers from  $Z^2$  and  $f$  is a function that assigns a gray-level value (from  $R$ ) to each distinct pair of coordinates  $(x, y)$
- (19) An image whose gray-levels span a significant portion of gray scale have \_\_\_\_\_ dynamic r



ference images.

a) Tie points

b) Réseau points

c) Known points

d) Key-points

(33) In the Visible spectrum the \_\_\_\_\_ colour has the maximum wavelength.

a) Violet

b) Blue

c) Red

d) Yellow

(34) Wavelength and frequency are related as : ( $c$  = speed of light)

a)  $c = \text{wavelength} / \text{frequency}$

b)  $\text{frequency} = \text{wavelength} / c$

c)  $\text{wavelength} = c * \text{frequency}$

d)  $c = \text{wavelength} * \text{frequency}$

(35) How is radiance measured?

a) lumens

b) watts

c) armstrong

d) hertz

(36) Which of the following is impractical to measure?

a) Frequency

b) Radiance

c) Luminance

d) Brightness

(37) What do you mean by achromatic light?

a) Chromatic light

b) Monochromatic light

c) Infrared light

d) Invisible light

(38) What is the output of a smoothing, linear spatial filter?

a) Median of pixels

b) Maximum of pixels

c) Minimum of pixels

d) Average of pixels

(39) Which of the following in an image can be removed by using smoothing filter?

a) Smooth transitions of gray levels

b) Smooth transitions of brightness levels

c) Sharp transitions of gray levels

d) Sharp transitions of brightness levels

(40) Which of the following is the disadvantage of using smoothing filter?

a) Blur edges

b) Blur inner pixels

c) Remove sharp transitions

d) Sharp edges

(41) In spatial domain, which of the following operation is done on the pixels in sharpening the image?

a) Integration

b) Average

c) Median

d) Differentiation

(42) In which of the following cases, we wouldn't worry about the behaviour of sharpening filter?

a) Flat segments

b) Step discontinuities

c) Ramp discontinuities

d) Slow varying gray values

(43) The objective of sharpening spatial filters is/are to \_\_\_\_\_

a) Highlight fine detail in an image

b) Enhance detail that has been blurred because of some error

c) Enhance detail that has been blurred because of some natural effect of some method of image acquisition

d) All of the mentioned

(44) Which of the facts(s) is/are true for the first order derivative of a digital function?

a) Must be nonzero in the areas of constant grey values

b) Must be zero at the onset of a gray-level step or ramp discontinuities

c) Must be nonzero along the gray-level ramps

d) None of the mentioned

(45) What is accepting or rejecting certain frequency components called as?

a) Filtering

b) Eliminating

- c) Slicing  
d) None of the Mentioned
- (46) What is the process of moving a filter mask over the image and computing the sum of products at each location called as?  
a) Convolution  
b) Correlation  
c) Linear spatial filtering  
d) Non linear spatial filtering
- (47) What is required to generate an  $M \times N$  linear spatial filter?  
a)  $MN$  mask coefficients  
b)  $M+N$  coordinates  
c)  $MN$  spatial coefficients  
d) None of the Mentioned
- (48) What is the difference between Convolution and Correlation?  
a) Image is pre-rotated by 180 degree for Correlation  
b) Image is pre-rotated by 180 degree for Convolution  
c) Image is pre-rotated by 90 degree for Correlation  
d) Image is pre-rotated by 90 degree for Convolution
- (49) The function that contains a single 1 with the rest being 0s is called \_\_\_\_\_  
a) Identity function  
b) Inverse function  
c) Discrete unit impulse  
d) None of the Mentioned
- (50) Which of the following involves Correlation?  
a) Matching  
b) Key-points  
c) Blobs  
d) None of the Mentioned.
- (51) An example of a continuous function of two variables is \_\_\_\_\_  
a) Identity function  
b) Intensity function  
c) Contrast stretching  
d) Gaussian function
- (52) In a dark image, the components of histogram are concentrated on which side of the grey scale?  
a) High  
b) Medium  
c) Low  
d) Evenly distributed
- (53) In \_\_\_\_\_ image we notice that the components of histogram are concentrated on the low side of an intensity scale.  
a) bright  
b) dark  
c) colourful  
d) All of the Mentioned
- (54) What is Histogram Matching also called as?  
a) Histogram Equalisation  
b) Histogram Specification  
c) Histogram linearisation  
d) None of the Mentioned
- (55) To reduce computation if one utilises non-overlapping regions, it usually produces \_\_\_\_\_ effect.  
a) Dimming  
b) Blurred  
c) Blocky  
d) None of the Mentioned
- (56) The type of Histogram Processing in which pixels are modified based on the intensity distribution of the image is called \_\_\_\_\_.  
a) Intensive  
b) Local  
c) Global  
d) Random
- (57) In uniform PDF, the expansion of PDF is \_\_\_\_\_  
a) Portable Document Format  
b) Post Derivation Function  
c) Previously Derived Function  
d) Probability Density Function
- (58) Which of the following fact(s) is/are true for the relationship between low frequency component of Fourier transform and the rate of change of gray levels?  
a) Moving away from the origin of transform the low frequency corresponds to smooth gray level variation  
b) Moving away from the origin of transform the low frequencies corresponds to abrupt change in gray level

- c) All of the mentioned  
d) None of the mentioned
- (59) Which of the following fact(s) is/are true for the relationship between high frequency component of Fourier transform and the rate of change of gray levels?
- a) Moving away from the origin of transform the high frequency corresponds to smooth gray level variation  
b) Moving away from the origin of transform the higher frequencies corresponds to abrupt change in gray level  
c) All of the mentioned  
d) None of the mentioned
- (60) To set the average value of an image zero, which of the following term would be set 0 in the frequency domain and the inverse transformation is done, where  $F(u, v)$  is Fourier transformed function of  $f(x, y)$ ?
- a)  $F(0, 0)$   
b)  $F(0, 1)$   
c)  $F(1, 0)$   
d) None of the mentioned
- (61) What is the name of the filter that is used to turn the average value of a processed image zero?
- a) Unsharp mask filter  
b) Notch filter  
c) Zero-phase-shift-filter  
d) None of the mentioned
- (62) Which of the following filter(s) attenuates high frequency while passing low frequencies of an image?
- a) Unsharp mask filter  
b) Lowpass filter  
c) Zero-phase-shift filter  
d) All of the mentioned
- (63) Which of the following filter have a less sharp detail than the original image because of attenuation of high frequencies?
- a) Highpass filter  
b) Lowpass filter  
c) Zero-phase-shift filter  
d) None of the mentioned
- (64) A spatial domain filter of the corresponding filter in frequency domain can be obtained by applying which of the following operation(s) on filter in frequency domain?
- a) Fourier transform  
b) Inverse Fourier transform  
c) None of the mentioned  
d) All of the mentioned
- (65) A frequency domain filter of the corresponding filter in spatial domain can be obtained by applying which of the following operation(s) on filter in spatial domain?
- a) Fourier transform  
b) Inverse Fourier transform  
c) None of the mentioned  
d) All of the mentioned
- (66) Which of the following is a receptor in the retina of human eye?
- a) Rods  
b) Cones  
c) Rods and Cones  
d) Neither Rods nor Cones
- (67) How is image formation in the eye different from that in a photographic camera?
- a) No difference  
b) Variable focal length  
c) Varying distance between lens and imaging plane  
d) Fixed focal length
- (68) What is brightness adaptation?
- a) Changing the eye's overall sensitivity  
b) Changing the eye's imaging ability  
c) Adjusting the focal length  
d) Transition from scotopic to photopic vision
- (69) What is the function of Iris?
- a) Source of nutrition  
b) Detect color  
c) Varies focal length  
d) Control amount of light
- (70) The absence of receptors is in the retinal area called \_\_\_\_\_
- a) Lens  
b) Ciliary body  
c) Blind spot  
d) Fovea