**Image Processing (RCS-082)**

**Unit 1**

1. What is the first and foremost step in Image Processing?  
a) Image restoration  
b) Image enhancement  
c) Image acquisition  
d) Segmentation

Answer: c

2. In which step of processing, the images are subdivided successively into smaller regions?  
a) Image enhancement  
b) Image acquisition  
c) Segmentation  
d) Wavelets

Answer: d

3. What is the next step in image processing after compression?  
a) Wavelets  
b) Segmentation  
c) Representation and description  
d) Morphological processing

Answer: d

4. What is the step that is performed before color image processing in image processing?  
a) Wavelets and multi resolution processing  
b) Image enhancement  
c) Image restoration  
d) Image acquisition

Answer: c

5. How many number of steps are involved in image processing?  
a) 10  
b) 9  
c) 11  
d) 12

Answer: a

6. What is the expanded form of JPEG?  
a) Joint Photographic Expansion Group  
b) Joint Photographic Experts Group  
c) Joint Photographs Expansion Group  
d) Joint Photographic Expanded Group

Answer: b

7. 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

Answer: d

8. 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

Answer: a

9. 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

Answer: c

10. Among the following image processing techniques which is fast, precise and flexible.  
a) Optical  
b) Digital  
c) Electronic  
d) Photographic

Answer: b

11. 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

Answer: c

12. What is pixel?  
a) Pixel is the elements of a digital image  
b) Pixel is the elements of an analog image  
c) Pixel is the cluster of a digital image  
d) Pixel is the cluster of an analog image

Answer: a

13. The range of values spanned by the gray scale is called:  
a) Dynamic range  
b) Band range  
c) Peak range  
d) Resolution range

Answer: a

14. Which is a colour attribute that describes a pure colour?  
a) Saturation  
b) Hue  
c) Brightness  
d) Intensity

Answer: b

15. 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

Answer: a

16. Which means the assigning meaning to a recognized object?  
a) Interpretation  
b) Recognition  
c) Acquisition  
d) Segmentation

Answer: a

17. The transition between continuous values of the image function and its digital equivalent is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_  
a) Quantisation  
b) Sampling  
c) Rasterisation  
d) None of the Mentioned

Answer: a

18. Images quantised with insufficient brightness levels will lead to the occurrence of \_\_\_\_\_\_\_\_\_\_\_\_  
a) Pixillation  
b) Blurring  
c) False Contours  
d) None of the Mentioned

Answer: c

19. The smallest discernible change in intensity level is called \_\_\_\_\_\_\_\_\_\_\_\_  
a) Intensity Resolution  
b) Contour  
c) Saturation  
d) Contrast

Answer: a

20. What is the tool used in tasks such as zooming, shrinking, rotating, etc.?  
a) Sampling  
b) Interpolation  
c) Filters  
d) None of the Mentioned

Answer: b

21. The type of Interpolation where for each new location the intensity of the immediate pixel is assigned is \_\_\_\_\_\_\_\_\_\_\_  
a) bicubic interpolation  
b) cubic interpolation  
c) bilinear interpolation  
d) nearest neighbour interpolation

Answer: d

22. The type of Interpolation where the intensity of the FOUR neighbouring pixels is used to obtain intensity a new location is called \_\_\_\_\_\_\_\_\_\_\_  
a) cubic interpolation  
b) nearest neighbour interpolation  
c) bilinear interpolation  
d) bicubic interpolation

Answer: b

23. Dynamic range of imaging system is a ratio where the upper limit is determined by  
a) Saturation  
b) Noise  
c) Brightness  
d) Contrast

Answer: a

24. For Dynamic range ratio the lower limit is determined by  
a) Saturation  
b) Brightness  
c) Noise  
d) Contrast

Answer: c

25. Histogram equalization or Histogram linearization is represented by of the following equation:  
a) sk =∑k j =1 nj/n k=0,1,2,……,L-1  
b) sk =∑k j =0 nj/n k=0,1,2,……,L-1  
c) sk =∑k j =0 n/nj k=0,1,2,……,L-1  
d) sk =∑k j =n nj/n k=0,1,2,……,L-1

Answer: b

26. What is the method that is used to generate a processed image that have a specified histogram?  
a) Histogram linearization  
b) Histogram equalization  
c) Histogram matching  
d) Histogram processing

Answer: c

27. Histograms are the basis for numerous spatial domain processing techniques.  
a) True  
b) False

Answer: a

28. 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

Answer: c

29. Which of the following is the primary objective of sharpening of an image?  
a) Blurring the image  
b) Highlight fine details in the image  
c) Increase the brightness of the image  
d) Decrease the brightness of the image

Answer: b

30. Image sharpening process is used in electronic printing.  
a) True  
b) False

Answer: a

31. 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

Answer: d

32. Image differentiation enhances the edges, discontinuities and deemphasizes the pixels with slow varying gray levels.  
a) True  
b) False

Answer: a

33. 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

Answer: d

34. Which of the following is the valid response when we apply a first derivative?  
a) Non-zero at flat segments  
b) Zero at the onset of gray level step  
c) Zero in flat segments  
d) Zero along ramps

Answer: c

35. Which of the following is not a valid response when we apply a second derivative?  
a) Zero response at onset of gray level step  
b) Nonzero response at onset of gray level step  
c) Zero response at flat segments  
d) Nonzero response along the ramps

Answer: b

36. If f(x,y) is an image function of two variables, then the first order derivative of a one dimensional function, f(x) is:  
a) f(x+1)-f(x)  
b) f(x)-f(x+1)  
c) f(x-1)-f(x+1)  
d) f(x)+f(x-1)

Answer: a

37. Isolated point is also called as noise point.  
a) True  
b) False

Answer: a

38. What is the thickness of the edges produced by first order derivatives when compared to that of second order derivatives?  
a) Finer  
b) Equal  
c) Thicker  
d) Independent

Answer: c

39. First order derivative can enhance the fine detail in the image compared to that of second order derivative.  
a) True  
b) False

Answer: b

40. Which of the following derivatives produce a double response at step changes in gray level?  
a) First order derivative  
b) Third order derivative  
c) Second order derivative  
d) First and second order derivatives

Answer: c

41. Which gray-level transformation increase the dynamic range of gray-level in the image?  
a) Power-law transformations  
b) Negative transformations  
c) Contrast stretching  
d) None of the mentioned

Answer: c

42. When is the contrast stretching transformation a linear function, for r and s as gray-value of image before and after processing respectively?  
a) r1 = s1 and r2 = s2  
b) r1 = r2, s1 = 0 and s2 = L – 1, L is the max gray value allowed  
c) r1 = 1 and r2 = 0  
d) None of the mentioned

Answer: a

43. When is the contrast stretching transformation a thresholding function, for r and s as gray-value of image before and after processing respectively?  
a) r1 = s1 and r2 = s2  
b) r1 = r2, s1 = 0 and s2 = L – 1, L is the max gray value allowed  
c) r1 = 1 and r2 = 0  
d) None of the mentioned

Answer: b

44. What condition prevents the intensity artifacts to be created while processing with contrast stretching, if r and s are gray-values of image before and after processing respectively?  
a) r1 = s1 and r2 = s2  
b) r1 = r2, s1 = 0 and s2 = L – 1, L is the max gray value allowed  
c) r1 = 1 and r2 = 0  
d) r1 ≤ r2 and s1 ≤ s2

Answer: d

45. A contrast stretching result been obtained by setting (r1, s1) = (rmin, 0) and (r2, s2) = (rmax, L – 1), where, r and s are gray-values of image before and after processing respectively, L is the max gray value allowed and rmax and rmin are maximum and minimum gray-values in image respectively. What should we term the transformation function if r1 = r2 = m, some mean gray-value.  
a) Linear function  
b) Thresholding function  
c) Intermediate function  
d) None of the mentioned

Answer: b

46. A specific range of gray-levels highlighting is the basic idea of \_\_\_\_\_\_\_\_\_\_  
a) Contrast stretching  
b) Bit –plane slicing  
c) Thresholding  
d) Gray-level slicing

Answer: d

47. What is/are the approach(s) of the gray-level slicing?  
a) To give all gray level of a specific range high value and a low value to all other gray levels  
b) To brighten the pixels gray-value of interest and preserve the background  
c) All of the mentioned  
d) None of the mentioned

Answer: c

48. Specific bit contribution in the image highlighting is the basic idea of \_\_\_\_\_\_\_\_\_\_  
a) Contrast stretching  
b) Bit –plane slicing  
c) Thresholding  
d) Gray-level slicing

Answer: b

49. Which of the following helps to obtain the number of bits to be used to quantize each pixel.  
a) Gray-level slicing  
b) Contrast stretching  
c) Contouring  
d) Bit-plane slicing

Answer: d

50. 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

Answer: c

**Unit 2**

1. If the Gaussian filter is expressed as H(u, v) = e(-D2 (u,v)/2D 02),where D(u, v) is the distance from point(u, v), D0 is the distance defining cutoff frequency, then for what value of D(u, v) the filter is down to 0.607 of its maximum value?  
a) D(u, v) = D0  
b) D(u, v) = D02  
c) D(u, v) = D03  
d) D(u, v) = 0

Answer: a

2. State the statement as true or false. “The GLPF did produce as much smoothing as the BLPF of order 2 for the same value of cutoff frequency”.  
a) True  
b) False

Answer: b

3. In general, which of the following assures of no ringing in the output?  
a) Gaussian Lowpass Filter  
b) Ideal Lowpass Filter  
c) Butterworth Lowpass Filter  
d) All of the mentioned

Answer: a

4. The lowpass filtering process can be applied in which of the following area(s)?  
a) The field of machine perception, with application of character recognition  
b) In field of printing and publishing industry  
c) In field of processing satellite and aerial images  
d) All of the mentioned

Answer: d

5. The edges and other abrupt changes in gray-level of an image are associated with\_\_\_\_\_\_\_\_\_  
a) High frequency components  
b) Low frequency components  
c) Edges with high frequency and other abrupt changes in gray-level with low frequency components  
d) Edges with low frequency and other abrupt changes in gray-level with high frequency components

Answer: a

6. A type of Image is called as VHRR image. What is the definition of VHRR image?  
a) Very High Range Resolution image  
b) Very High Resolution Range image  
c) Very High Resolution Radiometer image  
d) Very High Range Radiometer Image

Answer: c

7. The Image sharpening in frequency domain can be achieved by which of the following method(s)?  
a) Attenuating the high frequency components  
b) Attenuating the low-frequency components  
c) All of the mentioned  
d) None of the mentioned

Answer: b

8. The function of filters in Image sharpening in frequency domain is to perform reverse operation of which of the following Lowpass filter?  
a) Gaussian Lowpass filter  
b) Butterworth Lowpass filter  
c) Ideal Lowpass filter  
d) None of the Mentioned

Answer: c

9. If D0 is the cutoff distance measured from origin of frequency rectangle and D(u, v) is the distance from point(u, v). Then what value does an Ideal Highpass filter will give if D(u, v) ≤ D0 andifD(u, v) >D0?  
a) 0 and 1 respectively  
b) 1 and 0 respectively  
c) 1 in both case  
d) 0 in both case

Answer: a

10. What is the relation of the frequencies to a circle of radius D0, where D0 is the cutoff distance measured from origin of frequency rectangle, for an Ideal Highpass filter?  
a) IHPF sets all frequencies inside circle to zero  
b) IHPF allows all frequencies, without attenuating, outside the circle  
c) All of the mentioned  
d) None of the mentioned

Answer: c

11. Which of the following is the transfer function of the Butterworth Highpass Filter, of order n, D0 is the cutoff distance measured from origin of frequency rectangle and D(u, v) is the distance from point(u, v)?  
a) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11.png)  
b) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11a](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11a.png)  
c) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11b](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11b.png)  
d) none of the mentioned

Answer: a

12. Which of the following is the transfer function of the Ideal Highpass Filter? Given D0 is the cutoff distance measured from origin of frequency rectangle and D(u, v) is the distance from point(u, v).  
a) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11.png)  
b) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11a](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11a.png)  
c) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11b](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11b.png)  
d) none of the mentioned

Answer: b

13. Which of the following is the transfer function of the Gaussian Highpass Filter? Given D0 is the cutoff distance measured from origin of frequency rectangle and D(u, v) is the distance from point(u, v).  
a) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11.png)  
b) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11a](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11a.png)  
c) [digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11b](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-gaussain-lowpass-frequency-domain-filters-sharpening-q11b.png)  
d) none of the mentioned

Answer: c

14. For a given image having smaller objects, which of the following filter(s), having D0 as the cutoff distance measured from origin of frequency rectangle, would you prefer for a comparably smoother result?  
a) IHLF with D0 15  
b) BHPF with D0 15 and order 2  
c) GHPF with D0 15 and order 2  
d) All of the mentioned

Answer: c

15. Which of the following statement(s) is true for the given fact that “Applying Highpass filters has an effect on the background of the output image”?  
a) The average background intensity increases to near white  
b) The average background intensity reduces to near black  
c) The average background intensity changes to a value average of black and white  
d) All of the mentioned  
Answer: b

16. Color model is also named as (another name):  
a) Color space  
b) Color gap  
c) Color space & color system  
d) Color system

Answer: c

17. What do you mean by the term pixel depth?  
a) It is the number of bits used to represent each pixel in RGB space  
b) It is the number of bytes used to represent each pixel in RGB space  
c) It is the number of units used to represent each pixel in RGB space  
d) It is the number of mm used to represent each pixel in RGB space

Answer: a

18. How many bit RGB color image is represented by full-color image?  
a) 32-bit RGB color image  
b) 24-bit RGB color image  
c) 16-bit RGB color image  
d) 8-bit RGB color image

Answer: b

19. What is the equation used to obtain I(Intensity) component of each RGB pixel in RGB color format?  
a) I=1/2(R+G+B)  
b) I=1/3(R+G+B)  
c) I=1/3(R-G-B)  
d) I=1/3(R-G+B)

Answer: b

20. What is the equation used for obtaining R value in terms of HSI components?  
a) R=I[1-(S cos⁡H)/cos⁡(60°-H) ].  
b) R=I[1+(S cos⁡H)/cos(120°-H)].  
c) R=I[1+(S cos⁡H)/cos⁡(60°-H) ].  
d) R=I[1+(S cos⁡H)/cos(30°-H) ].

Answer: c

21. What is the equation used for calculating B value in terms of HSI components?  
a) B=I(1+S)  
b) B=S(1-I)  
c) B=S(1+I)  
d) B=I(1-S)

Answer: d

22. What is the equation used for calculating G value in terms of HSI components?  
a) G=3I-(R+B)  
b) G=3I+(R+B)  
c) G=3I-(R-B)  
d) G=2I-(R+B)

Answer: a

23. Which of the following color models are used for color printing?  
a) RGB  
b) CMY  
c) CMYK  
d) CMY and CMYK

Answer: d

24. 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

Answer: c

25. 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

Answer: b

26. What is the name of the filter that multiplies two functions F(u, v) and H(u, v), where F has complex components too since is Fourier transformed function of f(x, y), in an order that each component of H multiplies both real and complex part of corresponding component in F?  
a) Unsharp mask filter  
b) High-boost filter  
c) Zero-phase-shift-filter  
d) None of the mentioned

Answer: c

27. 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

Answer: a

28. 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

Answer: b

29. 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

Answer: b

30. Which of the following filter(s) attenuates low frequency while passing high frequencies of an image?  
a) Unsharp mask filter  
b) Highpass filter  
c) Zero-phase-shift filter  
d) All of the mentioned

Answer: b

31. 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

Answer: b

32. The feature(s) of a highpass filtered image is/are \_\_\_\_\_\_\_\_\_\_\_  
a) Have less gray-level variation in smooth areas  
b) Emphasized transitional gray-level details  
c) An overall sharper image  
d) All of the mentioned

Answer: d

33. 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

Answer: b

34. 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

Answer: a

35. Which of the following filtering is done in frequency domain in correspondence to lowpass filtering in spatial domain?  
a) Gaussian filtering  
b) Unsharp mask filtering  
c) High-boost filtering  
d) None of the mentioned

Answer: a

36. Using the feature of reciprocal relationship of filter in spatial domain and corresponding filter in frequency domain, which of the following fact is true?  
a) The narrower the frequency domain filter results in increased blurring  
b) The wider the frequency domain filter results in increased blurring  
c) The narrower the frequency domain filter results in decreased blurring  
d) None of the mentioned

Answer: a

37. A pixel p at coordinates (x, y) has neighbors whose coordinates are given by:  
(x+1, y), (x-1, y), (x, y+1), (x, y-1)  
This set of pixels is called \_\_\_\_\_\_\_\_\_\_\_\_  
a) 4-neighbors of p  
b) Diagonal neighbors  
c) 8-neighbors  
d) None of the mentioned

Answer: a

38. A pixel p at coordinates (x, y) has neighbors whose coordinates are given by:  
(x+1, y+1), (x+1, y-1), (x-1, y+1), (x-1, y-1)  
This set of pixels is called \_\_\_\_\_\_\_\_\_\_\_\_  
a) 4-neighbors of p  
b) Diagonal neighbors  
c) 8-neighbors  
d) None of the mentioned

Answer: b

39. What is the set of pixels of 8-neighbors of pixel p at coordinates (x, y)?  
a) (x+1, y), (x-1, y), (x, y+1), (x, y-1), (x+2, y), (x-2, y), (x, y+2), (x, y-2)  
b) (x+1, y), (x-1, y), (x, y+1), (x, y-1), (x+1, y+1), (x+1, y-1), (x-1, y+1), (x-1, y-1)  
c) (x+1, y+1), (x+1, y-1), (x-1, y+1), (x-1, y-1), (x+2, y+2), (x+2, y-2), (x-2, y+2), (x-2, y-2)  
d) (x+2, y), (x-2, y), (x, y+2), (x, y-2), (x+2, y+2), (x+2, y-2), (x-2, y+2), (x-2, y-2)  
Answer: b

40. Two pixels p and q having gray values from V, the set of gray-level values used to define adjacency, are m-adjacent if:  
a) q is in N4(p)  
b) q is in ND(p) and the set N4(p) ∩ N4(q) has no pixels whose values are from V  
c) Any of the mentioned  
d) None of the mentioned

Answer: c

41. Let S, a subset of pixels in an image, is said to be a connected set if:  
a) If for any pixel p in S, the set of pixels that are connected to it in Sis only one  
b) If it only has one connected component  
c) If S is a region  
d) All of the mentioned

Answer: d

42. Let R be a subset of pixels in an image. How can we define the contour of R?  
a) If R is a region, and the set of pixels in R have one or more neighbors that are not in R  
b) If R is an entire image, then the set of pixels in the first and last rows and columns of R  
c) All of the mentioned  
d) None of the mentioned

Answer: c

43. For pixels p(x, y), q(s, t), and z(v, w), D is a distance function or metric if:  
a) D(p, q) ≥ 0  
b) D(p, q) = D(q, p)  
c) D(p, z) ≤ D(p, q) + D(q, z)  
d) All of the mentioned

Answer: d

44. For pixels p(x, y), q(s, t), the Euclidean distance between p and q is defined as:  
a) D(p, q) = [(x – s)2 + (y – t)2]1/2  
b) D(p, q) = |x – s| + |y – t|  
c) D(p, q) = max (|x – s| + |y – t|)  
d) None of the mentioned

Answer: a

45. For pixels p(x, y), q(s, t), the city-block distance between p and q is defined as:  
a) D(p, q) = [(x – s)2 + (y – t)2]1/2  
b) D(p, q) = |x – s| + |y – t|  
c) D(p, q) = max (|x – s| + |y – t|)  
d) None of the mentioned

Answer: b

46. The domain that refers to image plane itself and the domain that refers to Fourier transform of an image is/are :  
a) Spatial domain in both  
b) Frequency domain in both  
c) Spatial domain and Frequency domain respectively  
d) Frequency domain and Spatial domain respectively

Answer: c

47. What is the technique for a gray-level transformation function called, if the transformation would be to produce an image of higher contrast than the original by darkening the levels below some gray-level m and brightening the levels above m in the original image.  
a) Contouring  
b) Contrast stretching  
c) Mask processing  
d) Point processing

Answer: b

48. For Image Enhancement a general-approach is to use a function of values of f (input image) in a predefined neighborhood of (x, y) to determine the value of g (output image) at (x, y). The techniques that uses such approaches are called \_\_\_\_\_\_\_\_  
a) Contouring  
b) Contrast stretching  
c) Mask processing  
d) None of the mentioned

Answer: c

49. The Laplacian in frequency domain is simply implemented by using filter \_\_\_\_\_\_\_\_\_\_  
a) H(u, v)= -(u2– v2)  
b) H(u, v)= -(1)  
c) H(u, v)= -(u2+ v2)  
d) none of the mentioned

Answer: c

50. Assuming that the origin of F(u, v), Fourier transformed function of f(x, y) an input image, has been correlated by performing the operation f(x, y)(-1)x+y prior to taking the transform of the image. If F and f are of same size, then what does the given operation is/are supposed to do?  
a) Resize the transform  
b) Rotate the transform  
c) Shifts the center transform  
d) All of the mentioned

Answer: c

**Unit 3**

1.Gaussian noise is referred to as

a.red noise

b.black noise

c.white noise

d.normal noise

Answer: (d).

2.Convolution in spatial domain is multiplication in

a.frequency domain

b.time domain

c.spatial domain

d.plane

Answer: (a).

3.Linear functions possesses the property of

a.additivity

b.homogeneity

c.multiplication

d.Both a and b

Answer: (d).

4.PDF in image processing is called

a.probability degraded function

b.probability density function

c.probabilistic degraded function

d.probabilistic density function

Answer: (b).

5.Filter that replaces the pixel value with the medians of intensity levels is

a.arithmetic mean filter

b.geometric mean filter

c.median filter

d.sequence mean filter

Answer: (c).

6.In geometric mean filters when alpha is equal to 1 then it works as

a.notch filter

b.bandpass filter

c.wiener filter

d.inverse filter

Answer: (d).

7.In wiener filtering it is assumed that noise and image are

a.different

b.homogenous

c.correlated

d.uncorrelated

Answer: (d).

8.EBCT scanners stands for

a.electrical beam computed tomography

b.electric beam computed tomography

c.electronic beam computed tomography

d.electron beam computed tomography

Answer: (d).

9. PSF stands for

a.probability spread function

b.point spread function

c.probability spike function

d.point spike function

Answer: (b).

10. Filter that performs opposite to band rejected filter is called

a.lowpass filter

b.bandpass filter

c.highpass filter

d.max filter

Answer: (b).

11.Degradation can be estimated by

a.2ways

b.3ways

c.4ways

d.5ways

Answer: (b).

12. The purpose of restoration is to gain

a. degraded image

b. original image

c. pixels

d. coordinates

Answer: (b).

13. Power spectra and noise of undegraded image must be known is a statement of

a. notch filter

b. bandpass filter

c. wiener filter

d.max filter

Answer: (c).

14. Contraharmonic mean filter produces

a.degraded image

b.original image

c.restored image

d.plane

Answer: (c).

15.One that is not the type of a mean filter

a.arithmetic mean filter

b.geometric mean filter

c.harmonic mean filter

d.sequence mean filter

Answer: (d).

16.Restoration can not be done using

a.single projection

b.double projection

c.triple projection

d.octa projection

Answer: (a).

17.Mean filters reduce noise using

a.sharpening

b.blurring

c.restoration

d.acquisition

Answer: (b).

18.In geometric mean filters when alpha is equal to 0 then it works as

a.notch filter

b.bandpass filter

c.parametric wiener filter

d.inverse filter

Answer: (c).

19.To improve the speed of convergence algorithm used is

a.newton

b.Raphson

c.wiener

d.newton-Raphson

Answer: (d).

20.Degraded image is produced using degradation process and

a.additive noise

b.destruction

c.pixels

d.coordinates

Answer: (a).

21.The inverse of image convolution is

a.image nonconvolution

b.image inconvolution

c.image deconvolution

d.image byconvolution

Answer: (c).

22.Impulse is simulated by

a.black dot

b.gray dot

c.bright dot

d.sharp dot

Answer: (c).

23.The approach to restoration is

a.inverse filtering

b.spike filtering

c.black filtering

d.ranking

Answer: (a).

24.Square of standard deviation is called

a.variance

b.noise

c.restoration

d.power

Answer: (a).

25.CT stands for

a.computerized tomography

b.computed tomography

c.computerized terminology

d.computed terminology

Answer: (b).

26.SNR in noise stands for

a.signal to noise ratio

b.serial to noise ratio

c.signal to notch ratio

d.serial to notch ratio

Answer: (a).

27.Approach that incorporates both degradation function and statistical noise in restoration is called

a.inverse filtering

b.spike filtering

c.wiener filtering

d.ranking

Answer: (c).

28.Bandreject filters are used where the noise components are usually

a.rejected

b.unknown

c.known

d.taken

Answer: (c).

29.Spatial filtering is used in the presence of

a.additive random noise

b.gamma noise

c.black noise

d.exponential noise

Answer: (a).

30.Order statistics filters are filters whose responses are based on

a.additive noise

b.probability density function

c.pixels

d.ranking

Answer: (d).

31.Images usually gets corrupted during

a.transmission

b.degradation

c.restoration

d.acquisition

Answer: (a).

32.Minimum mean square error filter is also called

a.square error filter

b.most square error filter

c.least square error filter

d.error filter

Answer: (c).

33.High frequency components are passed by

a.lowpass filter

b.bandpass filter

c.highpass filter

d.max filter

Answer: (c).

34.One that is not a type of a noise is

a.Rayleigh noise

b.gamma noise

c.black noise

d.exponential noise

Answer: (c).

35.Filter that replaces the pixel value with the minimum values of intensity levels is

a.max filter

b.geometric mean filter

c.median filter

d.min filter

Answer: (d).

36.FFT stands for

a.fast Fourier transform

b.frequency Fourier transform

c.frequency fast transform

d.fast frequency transform

Answer: (a).

37.Automatically determined filters provides inferior results as compared to

a.manually determined filters

b.bandpass filters

c.wiener filters

d.error filters

Answer: (a).

38.Frequencies in predefined neighborhood are rejected by

a.notch filter

b.bandpass filter

c.highpass filter

d.max filter

Answer: (a).

39.Degraded image is given in a

a.frequency domain

b.time domain

c.spatial domain

d.plane

Answer: (c).

40.Filter that computes midpoint between min and max value is called

a.max filter

b.midpoint filter

c.median filter

d.min filter

Answer: (b).

41.Low frequency components are passed by

a.lowpass filter

b.bandpass filter

c.highpass filter

d.max filter

Answer: (a).

42.Principle sources of noise arise during image

a.destruction

b.degradation

c.restoration

d.acquisition

Answer: (d).

43.Periodic noises arise from

a.electrical interference

b.gamma interference

c.beta interference

d.mechanical interference

Answer: (a).

44.Function having both properties of additivity and homogeneity is called

a.sharpening

b.spike noise

c.restoration

d.superposition

Answer: (d).

45.Fourier spectrum of noises are constant and usually called

a.red noise

b.black noise

c.white noise

d.green noise

Answer: (c).

46.Salt and pepper noise also referred to the term

a.Rayleigh noise

b.spike noise

c.black noise

d.exponential noise

Answer: (b).

47.Constrained least squares filter does not implies best in

a.Rayleigh noise

b.degradation

c.restoration

d.optimum restoration

Answer: (d).

48.Salt and pepper noise can interchangeably be used with

a.Rayleigh noise

b.gamma noise

c.black noise

d.impulse

Answer: (d).

49.Gaussian shape function has no

a.ones

b.zeros

c.pixels

d.coordinates

Answer: (b).

50.Filter that replaces the pixel value with the maximum values of intensity levels is

a.max filter

b.geometric mean filter

c.median filter

d.min filter

Answer: (a).

**Unit 4**

1. Which is meant by assuming any two neighboring that are both edge pixels with consistent orientation?  
   a) Canny edge detection  
   b) Smoothing  
   c) Segmentation  
   d) None of the mentioned

Answer : a

1. What is the process of breaking an image into groups?  
   a) Edge detection  
   b) Smoothing  
   c) Segmentation  
   d) None of the mentioned

Answer : c

1. How many types of 3-D image processing techniques are there in image perception?  
   a) 3  
   b) 4  
   c) 5  
   d) 6

Answer :c

1. Points exceeding the threshold in output image are marked as
2. 0
3. 1
4. 11
5. X

Answer :b

1. Example of discontinuity approach in image segmentation is:
2. Edge based segmentation
3. Boundary based segmentation
4. Region based segmentation
5. Both a & b

Answer :d

1. Image segmentation is based on?
2. Morphology
3. Set theory
4. Extraction
5. Recognition

Answer :a

1. Images whose principle features are edges is called:
2. Orthogonal
3. Isolated
4. Edge mapping
5. Edge normal

Answer :c

1. If R is the entire region of the image then union of all segmented parts should be equal to
2. R
3. R’
4. Rn
5. Ri

Answer :a

1. Laplacian Images need:
2. Contraction
3. Expansion
4. Scaling
5. Enhancement

Answer :c

1. For point detection we use:
2. First derivative
3. Second derivative
4. Third derivative
5. Both a & b

Answer :b

1. Textured inner region of the object produces
2. good boundary extraction
3. excellent boundary extraction
4. good boundary deletion
5. excellent boundary deletion

Answer :a

1. If the standard deviation of the pixels is positive, then sub image is labeled as
2. Black
3. Green
4. White
5. Red

Answer :c

1. Thresholding gives the
2. large image
3. gray scale image
4. color image
5. binary image

Answer :d

1. Segmentation is a process of:
2. low level processes
3. high level processes
4. mid level processes
5. edge level processes

Answer :c

1. Segmentation algorithms depends on intensity values
2. Discontinuity
3. Similarity
4. Continuity
5. Both a & b

Answer :d

1. Sudden changes in intensity produces peak in
2. first derivative
3. second derivative
4. third derivative
5. Both a and b

Answer :a

1. Edge detector method is used to detect
2. Area
3. Line
4. Point
5. Edge

Answer :d

1. Accuracy of image segmentation can be improved by the type of
2. Processes
3. Images
4. Divisions
5. Sensors

Answer :d

1. During segmentation every pixel of an image should be in
2. connected set
3. boundaries
4. region
5. concerned area

Answer :c

1. For line detection we use
2. first derivative
3. second derivative
4. third derivative
5. Both a and b

Answer :b

1. When the desired object is detected segmentation should be
2. Paused
3. Cleared
4. Continued
5. Stopped

Answer :d

1. Similarity approach of segmentation depends upon
2. low frequencies
3. smooth changes
4. abrupt changes
5. Contrast

Answer :b

1. For edge detection we combine gradient with
2. Sharpening
3. set theory
4. smoothing
5. thresholding

Answer :d

1. Lines are referred as
2. ramp edges
3. step edges
4. roof edges
5. Both a and b

Answer :c

1. Edges arise between thin objects and backgrounds are
2. ramp edges
3. step edge
4. roof edges
5. thinness of edges

Answer :c

1. For edge detection we observes
2. intensity transition
3. shape transition
4. color transition
5. sign transition

Answer :d

1. Thresholding is the example of
2. Discontinuity
3. Similarity
4. Continuity
5. Recognition

Answer :b

1. Algorithm stating that boundaries of the image are different from background is
2. Discontinuity
3. Similarity
4. Extraction
5. Recognition

Answer :a

1. Edge detection has fundamental
2. 2 points
3. 3 points
4. 4 points
5. 5 points

Answer : b

1. Canny edge detection algorithm is based on
2. Ideal Model
3. step edge
4. real model
5. smoothing model

Answer : b

1. Segmentation is usually not perfect due to number of factors such as

a) Noise, Bad illumination

b) Object Contain several region

c) Due to boundary-filling

d) Due to closed contour

Answer : a

1. What are the two approaches to segmentation?
2. Haar-like feature & 3-D rectangle approach
3. Region based segmentation & edge segmentation
4. Adaboost approach & edge segmentation
5. None of the above

Answer : b

1. Which technique applies Edge segmentation
2. Heuristics operator
3. Canny operator
4. All of the above
5. None of the above

Answer : c

1. Criteria for region segmentation
2. Pixels may be assigned to the same region
3. Pixels may be assigned to the different region
4. All of the above
5. None of the above

Answer : a

1. Pixels are allocated to categories according to the range of values in which a pixel lies is called
2. Thresholding based segmentation
3. Edge- based segmentation
4. Region based segmentation
5. None of the above

Answer : a

1. Edge element is associated with two components
2. Magnitude of the gradient
3. Region of the gradient
4. All of the above
5. None of the above

Answer : a

1. Threshold based segmentation is based on
2. Number of clusters
3. Clip level
4. Number of regions
5. All of the above

Answer : b

1. Which segmentation technique is based on clustering approaches?
2. K-means algorithm
3. Threshold based algorithm
4. Histogram based algorithm
5. Edge detection based algorithm

Answer : a

1. A gradient operator for edge detection is
2. Roberts
3. Second order derivative
4. Zero crossing operator
5. None

Answer : a

1. Image segmentation is the process of
2. Partitioning a digital image into multiple segment
3. Classify the image into number of object
4. None of the above
5. All of the above

Answer : a

1. Classical edge detectors uses
2. Prewitt operator
3. Robert operator
4. Threshold operator
5. Gaussian operator

Answer : a

1. Sobel edge detection uses
2. First derivative
3. Second derivative
4. All of the above
5. None of the above

Answer : a

1. Advantages of canny operator
2. Simplicity of the method
3. None of the above
4. Performance is good, Using probability for finding error rate
5. All of the above

Answer : c

1. Gray level image segmentation is generally based on two properties
2. Discontinuity and similarity
3. Continuity and similarity
4. Only similarity
5. None of the above

Answer : a

1. Edge based segmentation algorithm is using
2. Discontinuity and similarity
3. Threshold value
4. None of the above
5. Edge linking and boundary

Answer : d

1. The thresholding operation is a grey value re-mapping operation g defined by
2. 0 ( ) 1 if v t g v if v t ⎧⎫<=⎨⎬⎩⎭≥
3. 0 ( ) 1 if v t g v if v t ⎧⎫==⎨⎬⎩⎭>
4. 1 ( ) 0 if v t g v if v t ⎧⎫>=⎨⎬⎩⎭=
5. None of the above

Answer : a

1. Grey level thresholding is a generalization of
2. Edge detection
3. Binary thresholding
4. Both of the above
5. None of the above

Answer : b

1. Region growing is a ……………image segmentation approach
2. bottom-up
3. Top down
4. All of the above
5. None of the above

Answer : a

1. Example of Edge Detection Methods is
2. Neural Networks Segmentation
3. Graph Partitioning Methods
4. Watershed Transformation
5. Multi-scale Segmentation

Answer : c

1. Example of Region Growing Methods is
2. Level Set Methods
3. Graph Partitioning Methods
4. Watershed Transformation
5. Neural Networks Segmentation

Answer : d

**Unit 5**

1. For edge detection we use:
2. First derivation
3. Second derivation
4. Third derivation
5. Both A & B

Answer : a

1. What does the total number of pixels in the region defines?  
   a) Perimeter  
   b) Area  
   c) Intensity  
   d) Brightness

Answer : b

1. What is the unit of compactness of a region?  
   a) Meter  
   b) Meter2  
   c) No units  
   d) Meter-1

Answer : c

1. For which of the following regions, compactness is minimal?  
   a) Rectangle  
   b) Square  
   c) Irregular  
   d) Disk

Answer : d

1. Compactness is insensitive to orientation.  
   a) True  
   b) False

Answer : a

1. Which of the following measures are not used to describe a region?  
   a) Mean and median of grey values  
   b) Minimum and maximum of grey values  
   c) Number of pixels alone  
   d) Number of pixels above and below mean

Answer : c

1. We cannot use normalized area as one of the region descriptor.  
   a) True  
   b) False

Answer : b

1. What is the study of properties of a figure that are unaffected by any deformation?  
   a) Topology  
   b) Geography  
   c) Statistics  
   d) Deformation

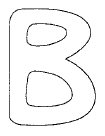
Answer : a

1. On which of the following operation of an image, the topology of the region changes?  
   a) Stretching  
   b) Rotation  
   c) Folding  
   d) Change in distance measure

Answer : c

1. Topological properties don’t depend on the distance measures.  
   a) True  
   b) False

Answer : a

1. What is the Euler number of the image shown below?  
   [](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-mcqs-q10.png)  
   a) 0  
   b) 1  
   c) 2  
   d) -1

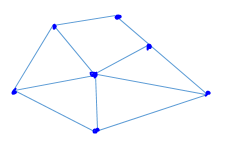
Answer : d

1. What is the Euler number of a region with polygonal network containing V,Q and F as the number of vertices, edges and faces respectively?  
   a) V+Q+F  
   b) V-Q+F  
   c) V+Q-F  
   d) V-Q-F

Answer : b

1. The texture of the region provides measure of which of the following properties?  
   a) Smoothness alone  
   b) Coarseness alone  
   c) Regularity alone  
   d) Smoothness, coarseness and regularity

Answer : d

1. What is the Euler number of the region shown in the figure below?  
   [](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-mcqs-q12.png)  
   a) 1  
   b) -2  
   c) -1  
   d) 2

Answer : b

1. Which of the following techniques is based on the Fourier transform?  
   a) Structural  
   b) Spectral  
   c) Statistical  
   d) Topological

Answer : b

1. Structural techniques deal with the arrangement of image primitives.  
   a) True  
   b) False

Answer : a

1. The length of a boundary is one of the boundary descriptors.  
   a) True  
   b) False

Answer : a

1. Which of the following of a boundary is defined as the line perpendicular to the major axis?  
   a) Equilateral axis  
   b) Equidistant axis  
   c) Minor axis  
   d) Median axis

Answer : c

1. Which of the following is the useful descriptor of a boundary, whose value is given by the ratio of length of the major axis to the minor axis?  
   a) Radius  
   b) Perimeter  
   c) Area  
   d) Eccentricity

Answer : d

1. If the boundary is traversed in the clockwise direction, a vertex point ‘p’ is said to be a part of the convex segment if the rate of change of slope at ‘p’ is:  
   a) Negative  
   b) Zero  
   c) Non negative  
   d) Cannot be determined

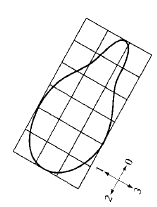
Answer : c

1. The order of shape number for a closed boundary is:  
   a) Odd  
   b) Even  
   c) 1  
   d) Any positive value

Answer : b

1. What is the order of the shape number of a rectangular boundary with the dimensions of 3×3?  
   a) 3  
   b) 6  
   c) 9  
   d) 12

Answer : d

1. he chain code for the following shape is given as:  
   [](https://www.sanfoundry.com/wp-content/uploads/2017/06/digital-image-processing-questions-answers-boundary-descriptors-2-q10.png)  
   a) 000030032232221211  
   b) 003010203310321032  
   c) 022332103210201330  
   d) 012302301023100321

Answer : a

1. What is the shape number for the boundary given in the previous figure?  
   a) 003231023101230123  
   b) 012301220331023010  
   c) 133021030012330120  
   d) 000310330130031303

Answer : d

1. Statistical moments are used to describe the shape of boundary segments quantitatively.  
   a) True  
   b) False

Answer : a

1. Which of the following techniques of boundary descriptions have the physical interpretation of boundary shape?  
   a) Fourier transform  
   b) Statistical moments  
   c) Laplace transform  
   d) Curvature

Answer : b

1. Statistical moments is sensitive to rotation.  
   a) True  
   b) False

Answer : b

1. The code length of Huffman Coding does not depend on the frequency of occurrence of characters.  
   a) true  
   b) false

Answer : b

1. In Huffman coding, data in a tree always occur?  
   a) roots  
   b) leaves  
   c) left sub trees  
   d) right sub trees

Answer : b

1. From the following given tree, what is the code word for the character ‘a’?  
   [huffman-code-questions-answers-q7](https://www.sanfoundry.com/wp-content/uploads/2018/07/huffman-code-questions-answers-q7.png)  
   a) 011  
   b) 010  
   c) 100  
   d) 101

Answer : a

1. What will be the cost of the code in Huffman coding if character ci is at depth di and occurs at frequency fi?  
   a) cifi  
   b) ∫cifi  
   c) ∑fidi  
   d) fidi

Answer : c

1. An optimal code will always be present in a full tree.  
   a) true  
   b) false

Answer : a

1. Which of the following is true about Huffman Coding?  
   (A) Huffman coding may become lossy in some cases  
   (B) Huffman Codes may not be optimal lossless codes in some cases  
   (C) In Huffman coding, no code is prefix of any other code.  
   (D) All of the above

Answer : c

1. The characters a to h have the set of frequencies based on the first 8 Fibonacci numbers as follows:

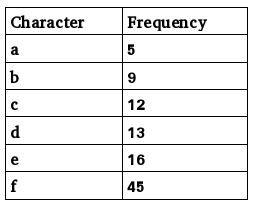
a : 1, b : 1, c : 2, d : 3, e : 5, f : 8, g : 13, h : 21

A Huffman code is used to represent the characters. What is the sequence of characters corresponding to the following code?

110111100111010

1. fdheg  
   (B) ecgdf  
   (C) dchfg  
   (D) fehdg

Answer : a

1. A networking company uses a compression technique to encode the message before transmitting over the network. Suppose the message contains the following characters with their frequency:  
   

Note that each character in input message takes 1 byte.

If the compression technique used is Huffman Coding, how many bits will be saved in the message?  
(A) 224  
(B) 800  
(C) 576  
(D) 324

Answer : c

1. **When is Run Length Encoding used?**
2. When we want to compress patterns of data
3. When we want to decompress patterns of data
4. When we want to encode running videos
5. Both a and b

Answer : d

1. Dilation followed by erosion is called
2. Opening
3. Closing
4. Blurring
5. Translation

Answer : b

1. Opening smooths the image's
2. Pixels
3. Lines
4. Contour
5. Boundary

Answer : c

1. Structuring elements have origins at
2. Top left
3. Top right
4. Center
5. Bottom left

Answer : c

1. With dilation process images get
2. Thinner
3. Shrinked
4. Thicker
5. Sharpened

Answer : c

1. Opening and closing are each others
2. Neighbours
3. Duals
4. Centers
5. Corners

Answer : b

1. Fully containment of the SE in an image is required in
2. Erosion
3. ‘dilation
4. Opening
5. Closing

Answer : a

1. Erosion followed by dilation is called
2. Opening
3. Closing
4. Blurring
5. Translation

Answer : a

1. Hit-or-miss transformation is used for shape
2. Removal
3. Detection
4. Compression
5. Decompression

Answer : b

1. Subimages used to probe the image is called
2. pixels
3. frames
4. structuring elements
5. coordinates

Answer : c

1. Closing produces
2. Narrow breaks
3. Lines
4. Dots
5. Noise

Answer : a

1. Dilation is used for
2. Bridging gaps
3. Translation
4. Scaling
5. Rotation

Answer : a

1. The translation of set B is the
2. {c|c = b+z}
3. {c|c = b-z}
4. {c|c = bxz}
5. {c|c = b}

Answer : a

1. In morphological operations SE is viewed as
2. correlation mask
3. convolution mask
4. low pass filter
5. High pass filter

Answer : b

1. (AoB)oB is equal to
2. A .B
3. A+B
4. A o B
5. AxB

Answer : c