

**SRM IST,Ramapuram**

**Department of ECE**

**Question Bank**

**Subject Code/Name : 18ECE243J/Digital Image and video Processing**

**Year/Semester : III/VI**

**Regulation : 2018**

**Unit -1**

**L1**

1. What is the average diameter of an eye?

- A. 20 mm
- B. 30 mm
- C. 15 mm
- D. 12mm

ANSWER: A

2. Which is made up of concentric layers of fibrous cells?

- A. Cornea
- B. Lens
- C. Choroid
- D. Sclera

ANSWER: B

3. What is the tough transparent tissue that covers anterior surface of the eye?

- A. Cornea
- B. Lens
- C. Choroid
- D. Sclera

ANSWER: A

4. Cone Vision is called

- A. Photopic
- B. Scotopic
- C. Retina
- D. Fovea

ANSWER: A

5. Pixel is defined as the

- A. Element of an matrix
- B. Dots
- C. Value
- D. Coordinate

ANSWER: A

6. What is the process of using known data to estimate the values of unknown location

- A. Interpolation
- B. Acquisition
- C. Contouring
- D. Sampling

ANSWER: A

7. What is the formula for storing the image in terms of bits

- A.  $b = N \times K$
- B.  $b = M \times N$
- C.  $b = M \times N \times K$
- D.  $b = M \times K$

ANSWER: C

8. What method is used to assign the intensity of new location using four nearest neighbors?

- A. Bilinear Interpolation
- B. Nearest neighbor interpolation
- C. Bicubic Interpolation
- D. Sixteen bit interpolation

ANSWER: A

9. Definition of binary image is

- A. Black and white Image
- B. Negative Image
- C. Mono Image
- D. Tri Image

ANSWER: A

10. The process of measuring brightness information only at a discrete spatial location is -----

- A. Sampling
- B. Quantization
- C. Resolution

D. Segmentation

ANSWER: C

11. The smallest discernible detail in an image is

A. Grey level resolution

B. Spatial resolution

C. Scalar resolution

D. Vector quantization

ANSWER: B

12. Tell the term that Change overall sensitivity of image

A. Illumination

B. Brightness

C. Brightness adaption

D. Illumination adaption

ANSWER: C

13. What is the bright vision of the eye?

A. Photopic

B. Scotopic

C. Adjusting the focal length

D. Transition from scotopic to photopic vision

ANSWER: A

14. What is the process of retrieving the original image from degraded image?

A. Image Enhancement

B. Image Restoration

C. Wavelet

D. Image compression

ANSWER: B

15. Name the coordinates of two dimensional function

A. Spatial coordinates

B. Frequency coordinate

C. Time coordinate

D. real coordinates

ANSWER: A

16. Cone Vision is called

A. Photopic

B. Scotopic

C. Retina

D. Fovea  
ANSWER: A

17. What is the function of Image Enhancement?  
A. Smoothing  
B. Sharpening  
C. Degradation  
D. Both A and B  
ANSWER: D

18. The process of assigning the label to an objects based on its descriptor is called  
A. Image Segmentation  
B. Image Enhancement  
C. Image Recognition  
D. Image Segmentation  
ANSWER: C

## **L2( UNIT-1)**

19. Calculate the number of bits are required to store a 128 X 128 image with 256 gray levels  
A. 131072  
B. 138890  
C. 142300  
D. 788777  
ANSWER: A

20. Calculate the number of bits are required to store a 256 X 256 image with 128 gray levels  
A. 458752  
B. 138890  
C. 142300  
D. 788777  
ANSWER: A

21. An image is 2400 pixels wide and 2400 pixels high. The image was scanned at 600 dpi. What will be the physical size of the image?  
A. 1.7 inches x 1.7 inches  
B. 4 inches x 4 inches  
C. 17 cm x 17 cm  
D. 4 cm x 4 cm  
ANSWER: B

22. \_\_\_\_\_ number of bits are required to store a 128 X 128 image with 32 gray levels

- A. 81920
- B. 10200
- C. 12340
- D. 44000

ANSWER: A

23. Calculate the size of an image if the numbers of bits stored is 4096 and the number of intensity levels 2.

- A. 64
- B. 32
- C. 16
- D. 24

ANSWER: A

24. Calculate the size of an image if the numbers of bits stored is 1024 and the number of intensity levels 2.

- A. 64
- B. 32
- C. 16
- D. 24

ANSWER: B

25. An image is 1800 pixels wide and 1800 pixels high. The image was scanned at 600 dpi. What will be the physical size of the image?

- A. 6 inches x 6 inches
- B. 4 inches x 4 inches
- C. 3 inches x 3 inches
- D. 4 cm x 4 cm

ANSWER: C

26. Calculate the size of an image if the numbers of bits stored is 8192 and the number of intensity levels 4.

- A. 64
- B. 32
- C. 16
- D. 24

ANSWER: A

27. \_\_\_\_\_ number of bits are required to store a 256 X 256 image with 32 gray levels

- A. 81920
- B. 327680
- C. 12340
- D. 44000

ANSWER: B

28. An image is 3600 pixels wide and 3600 pixels high. The image was scanned at 600 dpi. What will be the physical size of the image?

- A. 6 inches x 6 inches
- B. 4 inches x 4 inches
- C. 17 cm x 17 cm
- D. 4 cm x 4 cm

ANSWER: A

29. Calculate the number of bits are required to store a 128 X 128 image with 16 gray levels

- A. 131072
- B. 65536
- C. 142300
- D. 788777

ANSWER: B

30. An image is 3600 pixels wide and 3600 pixels high. The image was scanned at 400 dpi. What will be the physical size of the image

- A. 6 inches x 6 inches
- B. 9 inches x 9 inches
- C. 17 cm x 17 cm
- D. 4 cm x 4 cm

ANSWER: B

### **L3-UNIT 1**

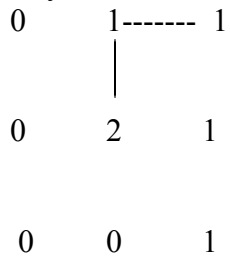
31. Assuming that a 10m high structure is observed from a distance of 20m. What is the size of retinal image? Assume that the distance between the lens and retina is 17mm.

- A. 8.5 mm
- B. 34 mm
- C. 0.118 mm

D. 34 cm

ANSWER: A

32. Identify the connectivity of the following



A. 8-Connectivity

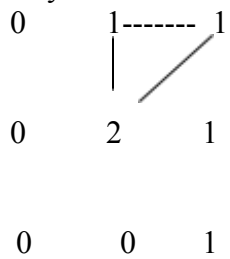
B. 4-Connectivity

C. 0-connectivity

D. 1-connectivity

ANSWER: B

33. Identify the connectivity of the following



A. 8-Connectivity

B. 4-Connectivity

C. 0-connectivity

D. 1-connectivity

ANSWER: B

34. Apply for 8-connectivity and identify the type of distance for the given

$$D_8(p, q) = \max(|x-s|, |y-t|)$$

- A. Chess board distance
- B. Euclidean distance
- C. City Block distance
- D. Both a and b

ANSWER: A

35. Apply for 2 pixel coordinates and identify the type of distance for the given

$$D(p, q) = ((x-s)^2 + (y-t)^2)^{1/2}$$

- A. Chess board distance
- B. Euclidean distance
- C. City Block distance
- D. Both a and b

ANSWER: B

36. Apply and identify the type of distance for the given  $D_4(p, q) = |x-s| + |y-t|$

- A. Chess board distance
- B. Euclidean distance
- C. City Block distance
- D. Both a and b

ANSWER: C

37. Fourier Transform is a

- A. Frequency domain
- B. Spatial domain
- C. Fourier domain
- D. Time domain

ANSWER: A

38. In standard 2D DFT, Low frequency grouped at ----- of matrix

- A. Edge
- B. Centre
- C. Upper left corner
- D. Bottom right corner

ANSWER: A

39. In standard 2D DFT, High frequency grouped at ----- of matrix

- A. Edge
- B. Centre
- C. Upper left corner
- D. Bottom right corner

ANSWER: B

40. In formula  $g(x,y) = T[f(x,y)]$ , T is the

- A. Transformed Image



- B. Transformation vector
- C. Transformation theorem
- D. Transformation function

ANSWER: D

41. The \_\_\_\_\_ deals with the conversion of three dimensional world co-ordinate to two dimensional image.

- A. Perspective Transformation
- B. Rotation
- C. Projective Transformation
- D. Non-linear mapping

ANSWER: A

42. What is the time complexity of Fast Fourier Transform for an N- point Discrete Fourier Transform?

- A.  $O(n^2)$
- B.  $O(n \log n)$
- C.  $O(\log 2n)$
- D. None of the above

ANSWER: B

43. Find the Fourier transform of  $f(m-m_0, n)$

- A.  $e^{-j2\pi m_0 k/N} F(k, l)$
- B.  $e^{j2\pi m_0 k/N} F(k, l)$
- C.  $\cos(2\pi j t)$
- D.  $\sin(2\pi j t)$

ANSWER: A

44. Find the DFT of unit impulse function

- A. 0
- B. -1
- C. j
- D. 1

ANSWER: D

45. Compute the 2D DFT of the  $4 \times 4$  grayscale image given below

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

a.  $\begin{bmatrix} 16 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

B.  $\begin{bmatrix} 25 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

C.  $\begin{bmatrix} 12 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

d.  $\begin{bmatrix} 10 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

ANSWER: A

46. Compute the 2D Inverse DFT of the  $4 \times 4$  grayscale image given below

$$\begin{bmatrix} 16 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

a.  $\begin{bmatrix} 1 & 1 & 1 & -1 \\ 1 & 1 & 1 & -1 \\ 1 & 1 & 1 & -1 \\ 1 & 1 & 1 & -1 \end{bmatrix}$

B.  $\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$

C.  $\begin{bmatrix} 12 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

D.  $\begin{bmatrix} 10 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

ANSWER: B

47. Which transform has excellent energy compaction for highly correlated data?

- A. DCT
- B. DFT
- C. FFT
- D. Z-Transform

ANSWER: A

48. If A is a DCT matrix of order N, and if the matrix A is given by

- A.  $A \times A^T = I$
- B.  $A^{-1} X A^{-1} = I$
- C.  $A \times A = I$
- D.  $A.A = I$

ANSWER: A

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**Unit -2**

**L1(Easy)**

1. Singular value decomposition of a rectangular matrix is defined, in which A is an  $m \times n$  matrix and U,V are orthonormal matrices. D is a diagonal matrix comprised of singular values of

- A.  $A = UDV^T$
- B.  $A = UDU^T$
- C.  $A = VDV^T$
- D.  $A = U^T D V^T$

ANSWER: A

2. SVD cannot be used for applications such as

- A. Image Compression
- B. Face recognition
- C. Text conversion
- D. Watermarking

ANSWER: C

3. Histogram of a dark image will be clustered towards the

- A. Higher gray level
- B. Lower gray level
- C. Restoration
- D. Segmentation

ANSWER: B

4. Histogram equalization is also called as

- A. Histogram Matching
- B. Image enhancement
- C. Histogram Linearization
- D. Edge detection

Answer: C

5. What are the undesirable side effects of Averaging filters?

- A. No side effects
- B. Blurred image
- C. Blurred edges
- D. Loss of sharp transitions

ANSWER : C

6. 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

ANSWER: A

7. Which of the following is a mask Processing Technique?

- A. Linear Smoothing filter
- B. Median filter
- C. Sharpening filter
- D. Histogram Equalization

ANSWER: A

8. 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

9. Choose the filter which has better performance in enhancing edges in an image?

- A. Mean filter
- B. Median filter
- C. Laplace filter
- D. Mode filter

ANSWER : C

10. . Application of median filter is to

- A. Reduce the salt noise
- B. Increase the salt and pepper noise
- C. Increase the salt noise
- D. Reduce the salt and pepper noise

ANSWER: D

11. Histogram equalization/Specification technique is a \_\_\_\_\_ technique

- A. Frequency domain
- B. Spatial domain
- C. Both Frequency and spatial domain
- D. Low pass frequency

ANSWER: C

12. What is accepting or rejecting of certain frequency components in an image is called as.....

- A. Filtering
- B. Slicing
- C. Eliminating
- D. Segregation

ANSWER: A

13. \_\_\_\_\_ filter used to emphasize the high frequency components represent image details without eliminating low frequency components representing the basic for a signal

- A. High boost filter
- B. High pass filter
- C. Median filter
- D. Low pass filter

ANSWER: A

14. Degradation function is

- A.  $G(u,v) / H(u,v)$
- B.  $G(u,v) / G(u,v)$
- C.  $H(u,v) / H(u,v)$
- D.  $H(u,v) / G(u,v)$

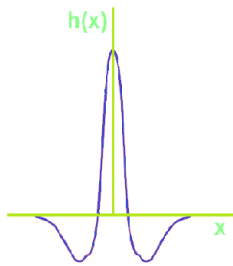
ANSWER: A

15. Process of restoration using an estimated degradation function is called

- A. Blind convolution
- B. Convolution
- C. Auto Correlation
- D. Cross Correlation

ANSWER: A

16. What is the characteristic of spatial domain filter in the following figure?



- A. High boost filter
- B. High pass filter
- C. Median filter
- D. Low pass filter

ANSWER B

17. Linear function possess the property of

- A. Additivity
- B. Homogeneity
- C. Multiplication
- D. Both A and B

ANSWER: D

18. Convolution in spatial domain is multiplication in

- A. Time domain
- B. Frequency domain
- C. Spatial
- D. Both time and frequency

ANSWER: B

19. Gaussian Noise is referred as

- A. Red noise
- B. Black noise
- C. White noise
- D. Normal noise

ANSWER: D

20. Principle Source of noise arises

- A. Destruction
- B. Degradation
- C. Acquisition
- D. Restoration

ANSWER: C



21. Salt noise also referred to the term

- A. spike noise
- B. Black noise
- C. White noise
- D. Normal noise

ANSWER: C

22. Pepper noise also referred to the term

- A. spike noise
- B. Black noise
- C. White noise
- D. Normal noise

ANSWER: B

23. What is the output of smoothing, linear spatial filter

- A. Median of pixel
- B. Maximum of pixel
- C. Minimum of pixel
- D. Average of pixel

ANSWER : D

24. The mask shown in the figure below belongs to which type of filter?

	1	1	1
$\frac{1}{9} \times$	1	1	1
	1	1	1

- a) Sharpening spatial filter
- b) Median filter
- c) Smoothing spatial filter
- d) Sharpening frequency filter

ANSWER : C

25. Which of the following expression is used to denote spatial domain process?

- a)  $g(x,y)=T[f(x,y)]$
- b)  $f(x+y)=T[g(x+y)]$
- c)  $g(xy)=T[f(xy)]$
- d)  $g(x-y)=T[f(x-y)]$

ANSWER : A

26. Which expression is obtained by performing the negative transformation on the negative of an image with gray levels in the range  $[0,L-1]$  ?

- a)  $s=L+1-r$
- b)  $s=L+1+r$
- c)  $s=L-1-r$
- d)  $s=L-1+r$

ANSWER : C

27. What is the general form of representation of log transformation?

- a)  $s=c\log_{10}(1/r)$
- b)  $s=c\log_{10}(1+r)$
- c)  $s=c\log_{10}(1*r)$
- d)  $s=c\log_{10}(1-r)$

ANSWER : b

28. Periodic noises arise from

- a) Electrical interference
- b) Gamma interference
- c) Beta interference
- d) Mechanical interference

ANSWER : a

29. Image restoration is to improve the \_\_\_\_\_ of the image

- a. quality
- b. noise
- c. intensity
- d. colour

ANSWER : a

30. Final step of enhancement lies in \_\_\_\_\_ of the sharpened image.

- a) Increase range of contrast
- b) Increase range of brightness
- c) Increase dynamic range
- d) None of the mentioned

ANSWER : c

31. An alternate approach to median filtering is \_\_\_\_\_

- a) Use a mask
- b) Gaussian filter
- c) Sharpening
- d) Laplacian filter

ANSWER : a

32. Dark characteristics in an image are better solved using \_\_\_\_\_.

- a) Laplacian Transform
- b) Gaussian Transform
- c) Histogram Specification
- d) Power-law Transformation

ANSWER : d

L2(Moderate)

1. What is the value of the centered pixel 4, if smoothened by a 3x3 box filter?

[1 2 3; 2 4 5; 3 4 3]

- A. 1
- B. 2
- C. 3
- D. 4

ANSWER: C

2. The inverse transformation from s back to r is denoted as:

- A.  $s=T^{-1}(r)$  for  $0 \leq s \leq 1$
- B.  $r=T^{-1}(s)$  for  $0 \leq r \leq 1$
- C.  $r=T^{-1}(s)$  for  $0 \leq s \leq 1$
- D.  $r=T^{-1}(s)$  for  $0 \leq s \leq 1$

ANSWER: C

3. The histogram of a digital image with gray levels in the range  $[0, L-1]$  is represented by a discrete function:

- A.  $h(r_k)=n_k$
- B.  $h(r_k)=n/n_k$
- C.  $p(r_k)=n_k$
- D.  $h(r_k)=n_k/n$

ANSWER: A

4. What is the maximum area of the cluster that can be eliminated by using an  $n \times n$  median filter?

- A.  $n^2$
- B.  $2/2$

C.  $2 \times n^2$

D.  $n$

ANSWER: B

5. The pixel values in a 5x 5 gray level image is

[1 2 3 1 2; 4 5 2 3 3; 3 3 5 4 4; 1 3 2 3 5; 2 1 3 1 3]

What is the value of the marked pixel after applying a 3 x 3 median filter?

A. 1

B. 2

C. 3

D. 4

ANSWER: C

6. Minimize salt and pepper noise by calculating median value for the pixels 0 and 255 in the given image

$$\begin{bmatrix} 24 & 22 & 33 & 25 & 32 & 34 \\ 34 & 255 & 24 & 0 & 26 & 23 \\ 23 & 21 & 32 & 31 & 28 & 26 \end{bmatrix}$$

A. 28, 24

B. 24, 28

C. 24, 24

D. 28, 28

ANSWER: A

7. Find the histogram equalization of the image

$$\begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

A. 
$$\begin{bmatrix} 6 & 6 & 6 & 6 & 6 \\ 2 & 6 & 7 & 6 & 2 \\ 2 & 7 & 7 & 7 & 2 \\ 2 & 6 & 7 & 6 & 2 \\ 6 & 6 & 6 & 6 & 6 \end{bmatrix}$$

B. 
$$\begin{bmatrix} 6 & 6 & 6 & 6 & 6 \\ 2 & 7 & 7 & 6 & 2 \\ 2 & 7 & 7 & 7 & 2 \\ 2 & 6 & 7 & 6 & 2 \\ 6 & 6 & 6 & 6 & 6 \end{bmatrix}$$

C.  $\begin{bmatrix} 6 & 2 & 6 & 6 & 6 \\ 2 & 6 & 7 & 6 & 2 \\ 2 & 7 & 7 & 7 & 2 \\ 2 & 6 & 7 & 6 & 2 \\ 6 & 6 & 6 & 6 & 6 \end{bmatrix} \begin{bmatrix} 6 & 2 & 6 & 6 & 6 \\ 2 & 6 & 7 & 6 & 2 \\ 2 & 7 & 7 & 7 & 2 \\ 2 & 6 & 7 & 6 & 2 \\ 6 & 6 & 6 & 6 & 6 \end{bmatrix}$

D.  $\begin{bmatrix} 6 & 6 & 6 & 6 & 6 \\ 2 & 6 & 7 & 6 & 2 \\ 2 & 7 & 7 & 7 & 2 \\ 6 & 6 & 7 & 6 & 2 \\ 6 & 6 & 6 & 6 & 6 \end{bmatrix}$

ANSWER: A

L3 (Tough)

1. If the size of the averaging filter used to smooth the original image to first image is 9, then what would be the size of the averaging filter used in smoothing the same original picture to second in second image?



A. 3

B. 5

C. 9

D. 15

ANSWER: D

2. The mask used to perform smoothing for an input image is

A.  $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

B.  $\begin{bmatrix} 1 & 1 & 1 \\ -1 & -1 & -1 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ -1 & -1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$

C.  $\begin{bmatrix} 1 & -1 & 1 \\ 1 & -1 & 1 \\ 1 & -1 & 1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$

D.  $\begin{bmatrix} 1 & 1 & 1 \\ -1 & 0 & -1 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ -1 & 0 & -1 \\ 1 & 1 & 1 \end{bmatrix}$

ANSWER : A

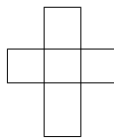
3. For a given image, compute the new pixel value for the marked pixel using the median filter of size 3x3 .Find Min value and max value.

2	3	4	5	6
3	1	2	3	8
5	3	2	1	3
4	1	2	3	2
3	2	1	4	2

- A. Min =1 Max= 8 Median =3
- B. Min =8 Max= 1 Median =8
- C. Min =1 Max= 3 Median =8
- D. Min =3 Max= 8 Median =3

ANSWER : A

4. An 4x4 image is given by  $\begin{bmatrix} 2 & 3 & 4 & 5 \\ 1 & 2 & 4 & 6 \\ 2 & 3 & 2 & 4 \\ 1 & 5 & 7 & 6 \end{bmatrix}$  .If this image is filtered by Min



filter with a mask given as , Then the resultant image (assume zero padding) is

A.  $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$   $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

B.  $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$   $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

C.  $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$   $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

D.  $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

ANSWER: A

5. For a given image, compute the new pixel value for the marked pixel using the median filter of size 3x3. Find Min value and max value.

$$\begin{bmatrix} 2 & 3 & 4 & 5 & 6 \\ 3 & 1 & 2 & 3 & 8 \\ 5 & 3 & 2 & 1 & 3 \\ 4 & 1 & 2 & 3 & 2 \\ 3 & 2 & 1 & 4 & 2 \end{bmatrix}$$

E. Min =1 Max= 8 Median =3

F. Min =8 Max= 1 Median =8

G. Min =1 Max= 3 Median =8

H. Min =3 Max= 8 Median =3

ANSWER : A

6. Perform the median filtering of the image using 3x3 mask for the pixel [19, 200, 150,22]

$$\begin{bmatrix} 12 & 13 & 14 & 15 & 16 & 17 \\ 18 & 19 & 200 & 190 & 170 & 52 \\ 72 & 150 & 22 & 32 & 190 & 11 \\ 22 & 190 & 22 & 32 & 190 & 11 \end{bmatrix}$$

A. 22,19, 72 , 100

B. 19, 22 , 72, 150

C. 22,19, 72 , 150

D. 19, 22 , 72, 100

ANSWER : B

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**Department of ECE**

**Question Bank**

**Subject Code/Name : 18ECE243J/Digital Image and video Processing**

**Year/Semester : III/VI**

**Regulation : 2018**

**Unit -3**

**L1(Easy)**

1. 1. \_\_\_\_\_ is process of partition the digital image in to multiple regions

- a.merging
- b.filling
- c.splitting
- d.transform

ANSWER :C

2. \_\_\_\_\_ is set of connected pixel that lie on the boundary between two regions.

- a.point
- b.edge
- c.colour
- d.line

ANSWER :B

3.the objective of the sharpening filter is \_\_\_\_\_

- a.highlight the intensity transitions
- b. highlight the low transitions
- c.highlight the bright transitions
- d. highlight the colour transitions

ANSWER :A

4. \_\_\_\_\_ has number of peaks

- a.bimodel histogram
- b.multimodel histogram
- c.histogram
- d.image



ANSWER :b

5. \_\_\_\_\_ is the starting pixel of region growing process.

- a.seed pixel
- b.base pixel
- c.original pixel
- d.image

ANSWER :a

7. \_\_\_\_\_ is the position of sign change of the first derivative among neighboring points

- a.edge
- b.zero-crossing
- c.point
- d.line

ANSWER :b

9. Abrivate ROI \_\_\_\_\_

- a.region of image
- b.region of interest
- c.region of indicator
- d.restoration of image

ANSWER :b

10. Smoothness reduce the bricks of

- A. Edges
- B. Point pixels
- C. Intensities
- D. Magnitude

Answer: A

11. The operator which can be used to detect the edges in an image is

- A. Adder
- B. Differentiator
- C. Integrator
- D. Subtractor

ANSWER: B

12. The operator used to detect edges in an image

- A. Logarithm
- B. Exponential
- C. Gradient
- D. Average

ANSWER: C

13. Sobel and Prewitt operators are used for which of the following operation?

- A. Contrast adjustment
- B. Edge detection
- C. Image averaging
- D. Segmentation

Answer: B

14. Sobel gradient is not that good for detection of

- A. Horizontal lines
- B. Vertical lines
- C. Diagonal lines
- D. Edges

Answer : C

15. Robert Kernel is defined as

- A.  $G_x = \begin{bmatrix} -1 & 0 \\ 1 & 1 \end{bmatrix}$   $G_y = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$
- B.  $G_x = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$   $G_y = \begin{bmatrix} 0 & -1 \\ 0 & 0 \end{bmatrix}$
- C.  $G_x = \begin{bmatrix} -1 & 1 \\ 0 & 1 \end{bmatrix}$   $G_y = \begin{bmatrix} 1 & -1 \\ 1 & 0 \end{bmatrix}$
- D.  $G_x = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$   $G_y = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$

ANSWER: D

16. Run Length Encoding is used for

- A. Reducing the repeated string of characters
- B. Bit error correction
- C. Correction of error in multiple bits
- D. All of the above

ANSWER : A

17. In Huffman coding, data in a tree always occur?

- A. Roots
- B. Leaves
- C. Left sub trees
- D. Right sub trees

ANSWER : B

18. Channel Encoder and Decoder pair is called

- A. Codes
- B. Module
- C. Channel
- D. Channel codec module

ANSWER : D

19. Lossy Compression is called as-----

- A. Reversible
- B. Irreversible
- C. Code
- D. Redundancy

ANSWER : B

20..Lossless Compression is called as-----

- A. Reversible
- B. Irreversible
- C. Code
- D. Redundancy

ANSWER : A

21.Compression ratio is defined as -----

- A. output file size x input file size
- B. output file size
- C. output file size / input file size
- D. input file size

ANSWER: C

22.Efficiency of Huffman code is -----

- A.  $H(s)/L$
- B.  $H(s)$
- C.  $H(s).L$
- D.  $L$

ANSWER : A

23.-----coding is effective when long sequence of the same symbol occur

- A. Run Length
- B. Huffman
- C. Arithmetic
- D. Predictive

ANSWER : A

24. Image Compression Comprised of

Compression ratio is defined as -----

- A. output file size x input file size
- B. output file size
- C. output file size / input file size
- D. input file size

ANSWER: C

25. Efficiency of Huffman code is -----

- A.  $H(s)/L$
- B.  $H(s)$
- C.  $H(s).L$
- D.  $L$

ANSWER : A

26. -----coding is effective when long sequence of the same symbol occur

- A. Encoder
- B. Decoder
- C. frames
- D. Both A and B

ANSWER : D

27. Information is the

- A. meaningful data
- B. Data
- C. Rawdata
- D. Both A and B

ANSWER: A

28. Coding redundancy works on

- A. Intensity
- B. Pixel
- C. Matrix
- D. Coordinates

ANSWER: A

29. Every Runlength pair introduce new

- A. Pixel
- B. Matrix
- C. Intensity
- D. Frames

ANSWER: C

30. Replication of pixel is called

- A. Coding redundancy
- B. Spatial redundancy
- C. Temporal redundancy
- D. Both A and B

ANSWER: D

## L2(Tough)

1. For the given image compute the degree of compression that can be achieved using Huffman

3	3	3	2
2	3	3	3
3	2	2	2
2	1	1	0

coding of pixel values. Assuming 2-bits to represent the pixel values.

- A. 1.14
- B. 2.14
- C. 3.14
- D. 4.14

ANSWER : A

2. In Huffman coding, the size of the codebook is  $L_1$ , while the longest code word can have as many as  $L_2$  bits. Relate  $L_1$  and  $L_2$ .

- A.  $L_1 = L_2$
- B.  $L_1 > L_2$
- C.  $L_1 < L_2$
- D.  $L_1 \neq L_2$

ANSWER : A

3. Find the run length code from fourth row for the given binary representation of image

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- A. (4, 0) (10,1) (4,0)
- B. (4, 1) (10,0) (4,1)

- C. (0, 0) (10,1) (4,0)  
 D. (4 ,0) (10,0) (4,1)

ANSWER : A

4. Obtain code word using Huffman code for the word “**COMMITTEE**”

- A. M = 01, T = 10, E = 11, C = 001, O = 0000, I = 0001  
 B. M = 11, T = 00, E = 11, C = 001, O = 0000, I = 0000  
 C. M = 00, T = 11, E = 11, C = 001, O = 0000, I = 1111  
 D. M = 01, T = 10, E = 11, C = 001, O = 1111, I = 0000

ANSWER : A

5. Obtain code word using Huffman code for the word “**MEMBER**”

- A. M = 1, E = 00, B = 010, R = 011  
 B. M = 0, E = 00, B = 010, R = 011  
 C. M = 1, E = 11, B = 010, R = 011  
 D. M = 1, E = 00, B = 010, R = 111

ANSWER: A

6. Obtain code word using Huffman code for the image

$$\begin{bmatrix} 3 & 3 & 3 & 2 \\ 2 & 3 & 3 & 3 \\ 3 & 2 & 2 & 2 \\ 2 & 1 & 1 & 0 \end{bmatrix}$$

- A. 3 = 1, 2 = 00, 1 = 010, 0 = 011  
 B. 3 = 0, 2 = 11, 1 = 010, 0 = 011  
 C. 3 = 1, 2 = 00, 1 = 000, 0 = 111  
 D. 3 = 1, 2 = 11, 1 = 010, 0 = 111

ANSWER : A

7. Entropy is

A.  $\sum_{x=X} px(X) \log 1/px(X)$

B.  $\sum_{x=X} \log 1/px(X)$

C.  $\sum_{x=X} px(X)$

D.  $\sum_{x=X} px(X) \log px(X)$

ANSWER: A

8. For the given image compute the degree of compression that can be achieved using Run Length coding of pixel values. Assuming 2-bits to represent the pixel value and 2 bits to represent the run length.

$$\begin{bmatrix} 3 & 3 & 3 & 2 \\ 2 & 3 & 3 & 3 \\ 3 & 2 & 2 & 2 \\ 2 & 1 & 1 & 0 \end{bmatrix}$$

- A. 1.33
- B. 2.33
- C. 3.33
- D. 4.33

ANSWER: A

9.Pixel exceeding the threshold in output image marked as

- A.0
- B.1
- C.11
- D.X

ANSWER : B

10.Lines in an image can be oriented as

- A.0
- B.90
- C.30
- D.Both A and B

ANSWER: D

11.For finding horizontal line we use mask of values

- A. [-1 -1 -1; 2 2 2; -1 -1 -1]
- B.[2 -1 -1; 1 2 -1; 1 -2 -1]
- C.[-1 2 -1; -1 2 -1; -1 2 -1]
- D.[-1 -1 2; -1 2 -1; 2 -1 -1]

ANSWER: A

### **L3(Tough)**

1. Generate a Tag using arithmetic coding procedure to transmit the word “**INDIA**”

- A.0.74304
- B.0.64204
- C.0.84204
- D.0.54304

ANSWER : A

2. ..Obtain Huffman code efficiency for the word “**COMMITTEE**”

- A. 98.98 %
- B. 97.97 %
- C. 96.96 %
- D. 95.95 %

ANSWER : B

3. Obtain Huffman code efficiency for the word “**MEMBER**”

- A. 98 %
- B. 97 %
- C. 96 %
- D. 95 %

ANSWER : D

4. Obtain Huffman code efficiency for the word “**ARCHITECTURE**”

- A. 98 %
- B. 97 %
- C. 96 %
- D. 95 %

ANSWER : C

5. A source emits four symbols (a, b, c, d) with the probabilities 0.4, 0.2, 0.1 and 0.3 respectively. Generate a tag using arithmetic coding procedure to encode the word “**dad**”

- A. Tag = 0.502
- B. Tag = 0.802
- C. Tag = 0.602
- D. Tag = 0.902

ANSWER : B

6. For finding Lines at 45 degree we use mask values

- A. [1 1 1; 2 2 2; 1 1 1]
- B. [2 -1 -1; -1 2 -1; -1 -1 2]
- C. [1 2 2; 1 2 2; -1 -1 -1]
- D. [-1 2 -2; -2 -2 -2; -1 -1 -1]



1. 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

Answer :C

2. Compression is done for saving
- A. Storage
  - B. Bandwidth
  - C. Money
  - D. Both A and B

Answer : D

3. Standard rate of showing frames in a video per second are
- A. 10
  - B. 20
  - C. 25
  - D. 30

Answer :D

4. Digital video is sequence of
- A. Pixels
  - B. Matrix
  - C. Frames
  - D. Coordinates

Answer :C

5. Gamma rays have largest
- A. Wavelength
  - B. Frequency
  - C. Energy
  - D. Power

Answer :B

6. Video file format is
- A. Tiff
  - B. AVI
  - C. WAV
  - D. Both a and b

Answer :B

7. PAL is
- A. Digital video standard
  - B. Analog video standard
  - C. Audio file standard
  - D. Image file standard

Answer :B

8. NTSC is
- A. Digital video standard
  - B. Analog video standard
  - C. Audio file standard
  - D. Image file standard

Answer :A

9. Block size in block preparation step of JPEG compression is
- A. 4 x 4
  - B. 16 x 16
  - C. 64 x 64
  - D. 8 x 8

Answer :D

10. The process of planning your multimedia presentation is
- A. Design
  - B. Layout
  - C. Development
  - D. Storyboard

Answer :C

11. DPI stands for
- A. Display per inch
  - B. Display point intersection
  - C. Dots per inch
  - D. Dots per intersection

Answer :C

12. Raster Scanning starts from
- A. Top left corner of the screen
  - B. Top right corner of the screen
  - C. Bottom left corner of the screen
  - D. Bottom right corner of the screen

Answer :A

13. The MIDI standard specifies how many channels?

- A. 16
- B. 24
- C. 32
- D. 40

Answer :A

14. With reference to multimedia elements, pick the odd-one out of the following

- A. Animation
- B. Audio
- C. Voice Script
- D. Video

Answer :C

15. MP3 is in which of the following MPEG standards?

- A. MPEG1
- B. MPEG2
- C. MPEG21
- D. MPEG3

Answer :D

16. If frames are displayed on screen fast enough, we get an impression of

- A. Signals
- B. Motions
- C. Packets
- D. Bits

Answer :B

17. How many types of video compressions?

- A. 2
- B. 3
- C. 4
- D. 6

Answer :A

18. MPEG stands for

- A. Motion Picture Express Group
- B. Motion Picture Expert Group
- C. Motion Picture Export Group
- D. None of these.

Answer :B

19. Which image files are a lossy format?

- A. GIFB.
- B. MPEG
- C. JPEG
- D. PNG

Answer :C

20. Expand JPEG.

- A. Joint Photo Experts Gross
- B. Joint Photographic Experts Group
- C. Joint Processor Experts Group
- D. Joint Photographic Expression Group

Answer :B

21. Which compressions provide some loss of quality?

- A. Lossy
- B. Loss less
- C. Cel based
- D. Object based

Answer :A

22. What does Avi stand for

- A. Audio for voice on internet
- B. Audio voice interleaved
- C. Audio video interface
- D. Adapted video for internet

Answer :B

23. A multimedia file

- A. is same as any other regular file
- B. Must be accessed at specific rate
- C. stored on remote server cannot be delivered to its client
- D. None of the mentioned

Answer :B

24. Which of the following two file formats has a smaller file size:

- A. MP3
- B. WAV
- C. MP4
- D. AVI

Answer :A

25. MP3 is an extension of a \_\_\_\_\_ file.

- A. Video file
- B. Graphics image
- C. Audio File
- D. Text File

Answer :C

26. 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

27. Aspect ratio of NTSC of digital video studio standard

- A. 4:3
- B. 3:2
- C. 2:3
- D. 1:3

Answer :A

28. Temporal rate of PAL of digital video studio standard

- A. 40
- B. 50
- C. 30
- D. 20

Answer :B

29. Nonrigid Motion is also called as

- A. Template matching
- B. Planar surface
- C. Deformable surface
- D. Polynomial surface.

Answer :C

30. Affine Transformation is defined as

- A.  $X' = RX + T$
- B.  $X' = RX - T$
- C.  $X' = RX * T$
- D.  $X' = RX / T$

Answer :A

30. Rotation in Homogeneous coordinate

- A.  $X_h' = R \sim X_h * T$
- B.  $X_h' = R \sim X_h - T$
- C.  $X_h' = R \sim X_h + T$
- D.  $X_h' = R \sim X_h$

Answer :D

31. Zooming in Homogeneous coordinate

- A.  $X_h' = S^{-1} X_h * T$
- B.  $X_h' = R^{-1} X_h - T$
- C.  $X_h' = R^{-1} X_h + T$
- D.  $X_h' = S^{-1} X_h$

Answer :D

32. 3-D Nonrigid motion is defined as

- A.  $X' = (D+R)X - T$
- B.  $X' = (D+R)X / T$
- C.  $X' = (D+R)X + T$
- D.  $X' = (D+R)X * T$

Answer :C

33. What are the different types of Geometric projection

- A. Perspective projection
- B. Orthographic Projection
- C. Surface projection
- D. Plane projection

Answer : A and B

34. Observation noise is

- A. Additive noise
- B. plane noise
- C. surface noise
- D. Signal –Dependent noise

Answer : A and D

35. Salt and Pepper noise is

- A. Additive noise
- B. White noise
- C. Black noise
- D. Gaussian noise

Answer : B and C



**18ECE243J**  
**Digital Image and Video Processing**  
**Unit-5**  
**2D Motion Estimation**

- 1 How do you estimate motion with temporal motion model?
  - A) First find the trajectory of individual points drawn in the (x,y,t) space of an image sequence.
  - B) The trajectory is linear function of velocity or displacement of moving object at each y
  - C) The trajectory is linear function of velocity of moving object at each x
  - D) The trajectory is linear function of displacement of moving object at each x
- 2 What is the method to solve the apparent motion and apparent displacement object?
  - A) 2D apparent motion
  - B) 2D displacement and correspond field
  - C) 2D apparent motion & 2D displacement and correspond field
  - D) **Pixel recursive algorithms and optical flow estimation**
- 3 A compressed video file can be downloaded as
  - A) Image
  - B) **Text file**
  - C) Video Option
  - D) Frame
- 4 Which one among the following is not a block distortion measure (BDM) for block matching motion estimation
  - A) Mean square error (MSE)
  - B) Mean absolute difference (MAD)
  - C) Peak to Signal Noise Ratio (PSNR)
  - D) **Structural Similarity Index (SSIM)**
- 5 In Multi-Resolution Motion Estimation technique
  - A) Motion vectors (MVs) in the highest resolutions are predicted by the motion vectors in the lower resolution and are refined at each step.
  - B) Motion vectors (MVs) in the lowest resolutions are predicted by the motion vectors in the higher resolution and are refined at each step.
  - C) Motion vectors (MVs) in the lowest resolutions are predicted by the motion vectors in the lower resolution and are refined at each step.
  - D) Motion vectors (MVs) in the highest resolutions are predicted by the motion vectors in the higher resolution and are refined at each step.
- 6 What is the type of motion model?
  - A) **Spatial motion model**
  - B) Slow motion model
  - C) Fast motion model
  - D) Frequency motion model
- 7 Motion compensation is very useful
  - A) To remove noise
  - B) To enhance signal
  - C) **Option A and B**
  - D) None
- 8 Which one is not correct in the following statements



- A) If the aperture is too small, the motion estimate may be poor to very wrong.  
 B) If the aperture is too large, then we will get exact measure of the movement of objects in our scene  
 C) **If the motion of the uniform dark region is parallel to the edge, then only motion can be detected**  
 D) Finding the right aperture size is not depends on the video content.
- 9 What are the some unavoidable problems with the block-matching approach?  
 i) A small block size can track small moving objects, but the resulting displacement estimate is then sensitive to image noise.  
 ii) A large block size is less sensitive to noise, but cannot track the motion of small objects.  
 iii) A large search area can track fast motion but is computationally intensive.  
 iv) A small search area may not be large enough to catch or track the real motion.  
 The correct answer is:  
 A) Statements (i) & (ii)  
 B) Statements (ii)& (iii)  
 C) Statements (i)& (iv)  
 D) **All the statements**
- 10 2-D motion, also called  
 A) **Projected motion**  
 B) circular motion  
 C) Rectilinear  
 D) Rotational
- 11 The correspondence field is also known as  
 A) **apparent 2-D displacement field**  
 B) apparent 2-D velocity field  
 C) Optical Flow Field  
 D) Projected motion
- 12 Which of the following statement is true?  
 (i) In the phase-correlation approach, the linear term of the Fourier phase difference between two consecutive frames determines the motion estimate  
 (ii) Block matching searches for the location of the best-matching block of a fixed size in the next frame(s) based on a distance criterion.  
 (A) Statement (i)  
 (B) Statement (ii)  
 (C) Statement (i) only  
 (D) **Both (i) & (ii)**
- 13 In Orthographic projection, all the rays from the 3-D object (scene) to the image plane travel  
 A) Circular motion  
 B) Perpendicular to each other  
 C) **Parallel to each other**  
 D) None
- 14 Which coding scheme is used to extend still-frame image compression methods to inter frame video compression?  
 A) motion-compensated coding  
 B) object/knowledge based coding  
 C) **3-D waveform coding**  
 D) Semantic Coding
- 15 What is the bit per CIF frame (352 x 288) for 3-D rigid or flexible objects with 3-D motion?

- A) Motion: 1100, Shape: 900, Color: 4000r<sub>s</sub>  
 B) **Motion: 600, Shape: 1300, Color: 15000r<sub>s</sub>**  
 C) Motion: 200, Shape: 1640, Color: 4000r<sub>s</sub>  
 D) Motion: 1800, Shape: 1000, Color: 5000r<sub>s</sub>
- 16 Object-based coding (OBC) methods are based on  
 A) **Structural image models**  
 B) 3-D motion  
 C) Contour modeling  
 D) Texture mapping
- 17 The steps of transform encoding involves  
 A) Construct NxN blocks → Quantizer → Forward DCT → Symbol encoder  
 B) **Construct NxN blocks → Forward DCT → Quantizer → Symbol encoder**  
 C) Symbol encoder → Forward DCT → Quantizer → Construct NxN blocks  
 D) Quantizer → Forward DCT → Construct NxN blocks → Symbol encoder
- 18 Bit allocation can be performed by  
 A) Globally  
 B) Zonal coding  
 C) using threshold coding  
 D) **All the above**
- 19 Which of the following statements is incorrect?  
 A) Direct search methods are useful when the optimization function is not differentiable  
 B) The gradient of  $f(x,y)$  is the a vector pointing in the direction of the steepest slope at that point.  
 C) **The second derivative of the optimization function is used to determine if we have reached an optimal point.**  
 D) The Hessian is the Jacobian Matrix of second-order partial derivatives of a function.
- 20 An initial estimate of an optimal solution is given to be used in conjunction with the steepest ascent method to determine the maximum of the function. Which of the following statements is correct?  
 A) The function to be optimized must be differentiable  
 B) If the initial estimate is different than the optimal solution, then the magnitude of the gradient is nonzero  
 C) As more iterations are performed, the function values of the solutions at the end of each subsequent iteration must be increasing.  
 D) **All 3 statements are correct.**
- 21 The speed of convergence of cauchy's steepest decent method depends on the condition number of hessian matrix. The steepest decent method works best when the condition number is close to infinity  
 A) **True**  
 B) False
- 22 Select the correct option:  
 i) The steepest decent method rapidly reduces the function value for minimization problem when the initial guess is far away from the optimum point  
 ii) The Newton's method converges very fast when the initial guess is near the optimum point.  
 A) Only statement –(i) is true  
 B) Only statement –(ii) is true  
 C) statement –(i) is true but statement –(ii) is false

- D) **Both the statements are true**
- 23 The transform which does not have a DC coefficient is  
 A) **Discrete Cosine transform**  
 B) Discrete sine transform  
 C) KL transform  
 D) KL transform
- 24 Which method is used to perform motion estimation at each level successively, starting with the lowest resolution level?  
 A) Deformable Block Matching  
 B) **Hierarchical block matching**  
 C) Symmetric block matching  
 D) Generalized block matching
- 25 In which coding procedure, the input bit string is parsed into blocks of variable length to form a dictionary of symbols?  
 A) Lossless predictive coding  
 B) Run-length coding  
 C) **Ziv-Lempel coding**  
 D) Transform coding

26. Gradient magnitude images are more are useful in

- A) Point detection  
 B) **Edge detection**  
 C) Line Detection  
 D) Area detection

27. What is method to solve the apparent motion and apparent displacement object?

- A) 2D apparent motion  
 B) 2D displacement and correspond field  
 C) 2D apparent motion & 2D displacement and correspond field  
 D) **Pixel recursive algorithms and optical flow estimation**

28. Which one among the following is not a block distortion measure (BDM) for block matching motion Estimation

- A) Mean square error (MSE)  
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 C) Peak to Signal Noise Ratio (PSNR)  
 D) **Structural Similarity Index (SSIM)**

29. Optimization method

- A) **Steepest-Descent Method**  
 B) MSE  
 C) PSNR  
 D) Signal Distortion method

30. A video frame consists of

- A) Signals
- B) Packet
- C) Slots
- D) Frame**

31. Joint Photographic Experts Group (JPEG) is used to compress

- A) Music
- B) Pictures
- C) Images**
- D) Frame

32. It refers to the covering/uncovering of a surface due to 3-D rotation and translation of an object which occupies only part of the field of view.

- A) Occlusion problem**
- B) Aperture Problem
- C) Slot problem
- D) Frame problem

33. 2-D motion also called

- A) Movement
- B) Projection Motion**
- C) Image motion
- D) Frame motion

34. Two types of Block motion

- A) Simple 2-D Translation**
- B) Pictures
- C) Images
- D) Various 2-D deformations of the block**

35. In Audio and Video Compression, voice is sampled at 8000 samples per second with

- A) 5 bits per sample
- B) 6 bits per sample
- C) 7 bits per sample
- D) 8 bits per sample**