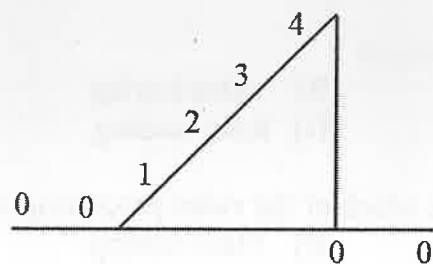


ii. Compare the histogram equalization and matching in terms of functionality. 3 3 2 2

28. a.i. How does region splitting differ from region merging in image segmentation? 4 4 3 3

ii. Plot the first and second derivative plots for the provided image. 6 4 3 3



(OR)

b. Explain the working of JPEG image compression with a block diagram and give detailed working of each block. 10 4 3 2

29. a. What are the various video filtering techniques used in video processing? Give examples for each category as well as their benefits and drawbacks. 10 4 4 2

(OR)

b. Explain how block-based motion compensation is useful in video processing and describe its functionality. 10 4 4 2

30. a. Explain how gradient based optimization works in video processing and how it captures local and global minima? 10 3 5 2

(OR)

b.i. Explain with examples how MPEG-2 can be useful for compression of images. 5 3 5 2

ii. Explain the role and functionality of group of pictures in video packaging. 5 3 5 2

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B.Tech. DEGREE EXAMINATION, MAY 2022
Sixth Semester

18ECE243J – DIGITAL IMAGE AND VIDEO PROCESSING
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours

Max. Marks: 75

PART – A (25 × 1 = 25 Marks)

Answer ALL Questions

- | | Marks | BL | CO | PO |
|--|-------|----|----|----|
| 1. When (x,y) and the intensity values are all finite discrete quantities, the image is referred to as
(A) Analog image (B) Digital image
(C) Negative image (D) Power image | 1 | 1 | 1 | 1 |
| 2. _____construct an image that represents a “Slice” through the object using sensed data.
(A) Magnetic resonance (B) Tomography
(C) X-ray (D) Gamma ray | 1 | 1 | 1 | 1 |
| 3. _____is a measurement of images tiniest details.
(A) Weber ratio (B) Mach bands
(C) Intensity level (D) Spatial resolution | 1 | 1 | 1 | 1 |
| 4. Which is responsible for dark light vision?
(A) Rods (B) Cones
(C) Fovea (D) Choroid | 1 | 2 | 1 | 1 |
| 5. The _____property helps computation of inverse matrix easier in discrete cosine transform.
(A) Transpose (B) Singular
(C) Orthogonal (D) Triangular | 1 | 2 | 1 | 1 |
| 6. The simplest spatial domain operations occur when the neighborhood is _____
(A) Pixels (B) Lines
(C) Plane (D) Point | 1 | 2 | 2 | 1 |
| 7. _____transformation are particularly useful for segmentation in which we want to isolate object from background.
(A) Filtering (B) Segmentation
(C) Thresholding (D) Morphology | 1 | 2 | 2 | 1 |

8. The general form of log grey level transformation is
 (A) $S = C * (\log(1+r))$ (B) $S = C \log r$
 (C) $S = C + \log r$ (D) $S = (1 + \log r) / C$
9. The _____ of an image shows us the distribution of grey level values in them.
 (A) Contrast (B) Histogram
 (C) Segmentation (D) Thresholding
10. _____ filtering converts an image matrix in to scaled outer product matrices.
 (A) Singular value decomposition (B) Unsharp masking
 (C) Wavelet transform (D) Histogram equalization
11. Which of the following is not a lossless method in image compression?
 (A) Huffman compression (B) Arithmetic coding
 (C) Run length coding (D) JPEG compression
12. The zero crossings of the second derivative can be used to locate the _____ of thick edges.
 (A) Corner (B) Center
 (C) Top (D) Bottom
13. The _____ operator is used to detect edges in an image.
 (A) Logarithm (B) Exponential
 (C) Gradient (D) Average
14. The _____ method generalizes zero suppression and runs sequences of data storing as single value and count.
 (A) Huffman coding (B) Run length coding
 (C) Arithmetic coding (D) Zero coding
15. Inter frame redundancy deals with _____
 (A) Spatial features (B) Temporal features
 (C) Random features (D) Adaptive features
16. Which of the following does not belong to the standardization group?
 (A) IETF (B) ITU
 (C) ISO (D) JCT
17. Which of the following modes is not part of MPEG 1 standard?
 (A) Intra (B) P-type
 (C) B-type (D) HAAR
18. MPEG-1 is proposed video format is
 (A) HD format (B) Standard format
 (C) Wide format (D) Chroma format
19. MPEG 1 specified and controlled according to the requirements set forth in
 (A) IEEE standard (B) ISO standard
 (C) DCT standard (D) JITU standard

20. The 3D wavelet coding uses temporal decomposition with
 (A) Interpolation (B) HAAR filters
 (C) Unsharp filters (D) Daubechies filters
21. The merging of an even and odd field of a frame together is known as
 (A) Field weaving (B) Field merging
 (C) Fast motion (D) Judder artifacts
22. Blue screen matting is also known as
 (A) Interpolation (B) Video keying
 (C) Chroma keying (D) Roto scoping
23. Parametric clustering is used in which of the video processing algorithm
 (A) Video filtering (B) Video coding
 (C) Video segmentation (D) Video scaling
24. _____ splits video into scenes based on similarity of frames or moving objects.
 (A) Spatial segmentation (B) Temporal segmentation
 (C) Predictive coding (D) Adaptive coding
25. Which of following conversion requires replicating a picture every 5 frames?
 (A) 40i to 50i (B) 50i to 60i
 (C) 40i to 60i (D) 30i to 40i

PART – B (5 × 10 = 50 Marks)

Answer ALL Questions

Marks BL CO PO

26. a. Explain how image processing employs neighborhood operations to accomplish desired connectivity. What do the numbers 2, 4, 8 mean when it comes to neighborhood connectivity?

(OR)

- b. Write short notes on
 (i) Image enhancement
 (ii) Image restoration
 (iii) Image morphology

27. a. Explain the working of high pass frequency filter in image sharpening. Give the working, application and examples of such use cases.

(OR)

- b.i. Equalize the histogram of the given image and plot the equalized histogram.

1	1	3	3
1	2	2	4
4	3	2	2