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**Reg. No. :**

**Question Paper Code:49044**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Elective

Electronics and Communication Engineering

14UEC910 - DIGITAL IMAGE PROCESSING

(Regulation 2014)

Duration: Threehours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Amount of energy that flows from the light source is

 (a) Brightness (b) Radiance (c) Luminance (d) Reflectance

 2. Intensity levels in 8-bit image are

 (a) 128 (b) 255 (c) 256 (d) 512

3. Smoothing filters are mostly used in

 (a) Blurring (b) Noise reduction (c) Contrast (d) A and B

4. The method used to generate a processed image that has a constant histogram is called

 (a)Histogram enhancement (b) Histogram matching

 (c) Histogram normalization (d) Histogram equalization

5. Salt and pepper noise can be interchangeably used with

 (a) Rayleigh noise (b) Gamma noise (c) Black noise (d) Impulse noise

6. In Geometric mean filter if the parameter α=1 then it work as

 (a) Inverse filter (b) Weiner filter (c) Band pass filter (d) Notch filter

 7. Second derivative approximation says that it is non-zero at

 (a) Intensity ramps (b) onset

 (c) Constant intensity (d) All mentioned above

8. Gradient computation is more useful in

 (a) Point detection (b) Edge detection (c) Area detection (d) Line detection

9. The Hit-or-Miss transformation is used for shape \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (a) Removal (b) detection (c) Compression (d) Decompression

10. When working with images we require the structuring elements be

1. Square elements (b) rectangular elements

 (c) triangular elements (d) Circular elements

PART - B (5 x 2 = 10 Marks)

11. Define the term mach band effect.

12. What is the need for Directional Smoothing in image processing?

13. How an image degradation process is modeled?

14. Define an Edge.

15. List various basic morphological algorithms.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss in detail about the process of sampling and Quantization. (16)

Or

 (b) Explain in detail about KL transform of images with its properties. Also explain fast

 KL transform. (16) .

17. (a) Describe histogram specification technique in detail with its associated

 equations. (16)

Or

 (b) Compare Smoothing and Sharpening spatial filters. (16)

18. (a) Explain how periodic noise reduction is performed by Frequency domain filtering. (16)

 Or

 (b) Evaluate the image restoration with the help of spatial filtering. (16)

19. (a) Summarize region based image segmentation techniques. (16)

Or

 (b) How edge detection is performed in digital images by

 (i) Gradient Operator. (4)

1. Maar-Hildreth edge detector . (6)
2. The Canny edge detector. (6)

20.(a) Explain in detail about Boundary descriptors. (16)

 Or

(b) Describe the following

 (i) Convex Hull. (4)

1. Skeletons. (6)
2. Pruning. (6)