KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV 2015

(Regulation 2009)

Seventh Semester

MECHATRONICS ENGINEERING

MCT148 **:** Digital Image Processing

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Intensity range of 8-bit pixel image is

   a) 0 to 7 b) 0 to 15

   c) 0 to 31 d) 0 to 255

2. The number of bits required to represent a 256 X 256 image with 256 gray level is

   a) 524288 b) 324288

   c) 65536 d) 35536

3. In _____ image, the components of histogram are concentrated on the low side on intensity scale.

   a) bright b) colorful

   c) dark d) poor contrast

4. The transformation that maps a narrow range of gray level values to a wider range is :

   a) log transformation b) image negation

   c) power law transformation d) contrast stretching

5. For an eight bit image x(m, n), the transformation y(m, n) = 255 – x(m, n) will yield

   a) a dark image b) a bright image

   c) a negative image d) an output image same s input image

6. Smoothing spatial filters are used for

   a) blurring b) noise reduction

   c) averaging d) all the above

7. The transform which posses the multi resolution property is

   a) fourier transform b) cosine transform

   c) short time fourier transform d) wavelet transform

8. Color printer works by using

a) cyan, magenta, yellow and black dynes
b) red, magenta, yellow and black dynes
c) HSV
d) cyan, blue, yellow and black dynes

9. Image compression is

a) making image look better
b) sharpening the intensity-transition regions
c) reducing the redundancy of the image data
d) minimizing degradation over image

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

a) logarithm
b) exponential
c) gradient
d) average

PART B (10 x 2 = 20 Marks)

11. Differentiate photopic and scotopic vision
12. What is meant by mach band effect?
13. Define image enhancement.
14. Can two different images have the same histogram? Justify your answer.
15. Give the formula for transfer function of a Butterworth low pass filter.
16. Write the steps involved in frequency domain filtering.
17. List the applications of color models.
18. Mention the relationship between scale and frequency.
19. What is run length coding?
20. What is an edge segment? How is it different from a boundary?

PART C (5 x 14 = 70 Marks)

21. a) What is meant by Digital Image Processing? Describe in detail about the fundamental steps in image processing.

(OR)

b) i) Explain about the basic elements of digital image processing. (8)
ii) Describe the basic relationship between the pixels. (6)

22. a) Summarize the gray level transformation techniques used for image enhancement.

(OR)

b) i) Elucidate the image enhancement using ALU (8)
ii) Explain the histogram equalization procedure. (6)

23. a) Discuss about image smoothing using frequency domain filters

(OR)

b) i) Explain the properties of 2D discrete Fourier Transform (8)

ii) Design a Butterworth filter for sharpening operation. (6)

24. a) Write short notes on Image pyramid and Sub band coding

(OR)

b) Discuss about HSI color model.

25. a) Differentiate between lossless and lossy compression and explain transform coding system with a neat diagram.

(OR)

b) Discuss about how points, lines and edges can be detected using appropriate masks.

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