KUMARAGURU
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Register Number:……..

B.E DEGREE EXAMINATIONS: NOV / DEC 2014

(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. Sampling of an image is required for _____.
   a) Quantization b) Sharpening
   c) Smoothing d) Digitization.
2. Consider an image of size M X N with 64 gray levels. The total number of bits required to store this digitized image is
   a) M X N X 64 b) M X N X 63
   c) M X N X 6 d) M X N X 8
3. Give the formula for negative transformation.
   a) S=L-1-r b) S=L+1-r
   c) S= L-1+r d) S=L+1+r
4. Histogram Equalization is mainly used for _____.
   a) Image enhancement b) Contrast adjustment
   c) Blurring d) Zooming
5. The Fourier transform of the exponential signal $e^{J\omega_0 t}$ is
   a) a constant b) a rectangular gate
   c) an impulse d) a series of impulses.
6. Every convolution operation in the spatial domain has an equivalent _____ operation in the frequency domain.
   a) Addition b) multiplication
   c) Subtraction d) division

7. CMY model is used for

a) color monitor & color video camera b) color printing

c) color image processing d) color picture transmission

8. The idea with wavelets is to represent a complicated function by

a) sinus functions b) square functions

c) Lines d) simple basic functions

9. Image compression is for _____.

a) making image look better b) sharpening the intensity transition regions

c) minimizing degradation over image d) reducing the redundancy of the image data

10. Localization of iris, pupil, eyelids come under

a) Normalization b) masking

c) Extraction d) segmentation

PART B (10 x 2 = 20 Marks)

11. Define Image.
12. What do you mean by Aliasing?
13. Specify the objective of image enhancement technique.
14. What are drawbacks of histogram equalization?
15. Write the steps involved in frequency domain filtering.
16. Write the expression for Butterworth low pass filter.
17. List the hardware oriented color models?
18. What is the need for transform?
19. What are the operations performed by error free compression?
20. Write the applications of segmentation.

PART C (5 x 14 = 70 Marks)

21. a) Describe the function of elements of digital image processing system.

(OR)

b) Discuss in detail about sampling and quantization.

22. a) Explain the types of gray level transformation.

(OR)

b) Describe histogram equalization. Obtain Histogram equalization for the following image segment of size 5 x 5? Write the inference on image segment before and after equalization.

8	4	2	3	1
5	3	6	7	2
6	4	3	1	5
1	7	2	4	6
6	5	3	1	4

23. a) Discuss in detail about 2D Fourier transform and its inverse.

(OR)

b) Discuss about the image smoothing filters with its model in the frequency domain.

24. a) Explain RGB and HSI models. Briefly discuss about conversion from RGB to HSI model and vice-versa.

(OR)

b) Obtain the Haar transformation matrix for N=2. Analyze the sign change and write the matrix for N=8.

25. a) Generate the tag for the sequence 1 3 2 1 for the probabilities P (1) =0.8, P (2) =0.02, P (3) =0.18. How an image is compressed using JPEG Image compression standard?

(OR)

b) What is edge detection? Describe in detail about the types of edge detection operation.

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