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Question Paper Code : 11509

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2016

Eighth Semester

Electronics and Communication Engineering

CS 1002 – DIGITAL IMAGE PROCESSING

(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Write the orthogonality property of a 2D DFT.
2. What is quantization error ? How this can be reduced ?
3. Give the formula for negative and log transformation.
4. Give the mask used for high boost filtering.
5. What are the basic operations in a geometric transformation used for image restoration ?
6. Draw the model of image restoration process.
7. Differentiate between lossless compression and lossy compression.
8. What are the different image compression standards available ?
9. Define Segmentation.
10. What is meant by Chair code ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Describe about Karhunen-Loeve transform with an example. (8)
(ii) Explain with an example about basic geometric transformation. (8)

OR

- (b) (i) Discuss the properties and applications of (1) Hadamard transform
(2) Discrete Cosine Transforms. (8)
(ii) Describe the functions of elements of digital image processing system with a diagram. (8)
12. (a) (i) Illustrate the principle of histogram equalization with an example. (8)
(ii) Discuss the principle of smoothing using various masks. (8)

OR

- (b) (i) Explain the principles of high-boost filtering and its application. (8)
(ii) Discuss the effects of ideal low pass and high pass filters with cut-off frequencies at different radii. (8)
13. (a) (i) Describe the image degradation process and its remedy. (8)
(ii) What is SVD ? How this is computed ? Explain an application. (8)

OR

- (b) (i) Compare the image enhancement and restoration. (7)
(ii) Describe constrained least mean square filtering approach for image restoration. (9)
14. (a) (i) Explain the arithmetic coding process by solving the below. (8)

Source symbol	Probability
a1	0.8
a2	0.02
a3	0.18

Encode a1, a3, a2, a1.

- (ii) Explain the Lempel-Ziv-Welch coding. (8)
- OR**
- (b) (i) Explain about the JPEG and MPEG techniques. (8)
(ii) Explain the vector quantization. (8)
15. (a) (i) Discuss the boundary extraction and representation. (8)
(ii) Write a short notes on Types of Threshold. (8)

OR

- (b) (i) Discuss about the boundary descriptors. (8)
(ii) Explain about the Texture. (8)