Hall Ticket Number:

Code No. : 9213

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.Tech. I Year (CSE) II-Semester (Main) Examinations, July-2016
Image Processing

Time: **3** hours   Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Describe the importance of resolution factor in image representation.
2. Give the details of image formation model.
3. Find 2D-DFT of $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ of 2x2 matrix.
4. What are the walsh and Hadamard transforms?
5. What is smoothing and how is it performed in spatial domain?
6. Write a method used for line detection in an image.
7. What is the image compression? Whether any data is lost when an image is compressed?
8. Draw the block diagram of image compression model.
9. What is meant by Image Restoration?
10. List three methods for estimating the degradation function.

Part-B (5 × 10 = 50 Marks)

11. a) Explain the basic elements of digital image processing.   [5]
    b) Explain the sampling and quantization with neat diagram.   [5]

12. a) The image f(m, n) is given below. What will be the value of F(0, 0).   [5]

$$\begin{bmatrix} 0 & 1 & 2 & 1 & 4 \\ 4 & 1 & 4 & 5 & 6 \\ 1 & 2 & 1 & 0 & 4 \\ 5 & 4 & 1 & 3 & 5 \\ 4 & 2 & 4 & 5 & 6 \end{bmatrix}$$

    b) Derive forward and inverse transforms of KL- transform.   [5]

13. a) Suppose that a 64 x 64 8-level image has the following gray level distribution   [6]

Gray levels r_k	0	1	2	3	4	5	6	7
No. of pixels n_k	780	1024	855	650	335	240	125	83

    Perform histogram equalization and draw the original and equalized histogram.
    b) What are the Morrie patterns and Joggies?   [4]

14. a) Explain various steps involved in dynamic thresholding and adaptive thresholding   [5]
       techniques .
    b) Describe encoding and decoding steps of the Huffman compression method.   [5]

15. a) Explain the different noise distribution models in detail.   [5]
    b) Describe Inverse filtering used in image restoration.   [5]

16. a) Describe the basic neighborhood relationship between the pixels.   [5]
    b) Explain any three properties of 2D- Discrete Fourier Transform.   [5]

17. Write short notes on any **two** of the following:
    a)   Wiener Filtering   [5]
    b)   Minimum mean square filtering   [5]
    c)   Contour coding.   [5]

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