

Total No. of Questions :6]

SEAT No. :

P84

OCT. -16/BE/Insem. - 139

[Total No. of Pages :2

B.E. (E & Tc)

DIGITAL IMAGE PROCESSING

(2012 Course) (Semester - I) (Elective - I) (404184 A)

Time : 1 Hour]

[Max. Marks :30

Instructions:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
- 2) Assume suitable data if necessary.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Figures to the right indicate full marks.

Q1) a) Explain the concept of color model with examples of RGB color model and CMY color model. State applications of both. [6]

b) 5×5 image is given below. Find the distance between pixels P and Q by following methods. [4]

i) City block

ii) Chess board

Coordinates of P & Q are (0,4) and (4,1)

				P
1	0	0	0	1
0	0	0	1	1
1	0	1	1	0
0	0	1	0	1
0	1	1	0	0
	Q			

OR

Q2) a) What is the significance of sampling and quantization? Also explain the concept of resolution with reference to the same. [6]

b) List three basic geometrical operations in image processing. Explain any one of them. [4]

P.T.O.

Q3) a) What is meant by image restoration? Explain image restoration process with the help of block diagram. [6]

b) Find negative image matrix of following 8-bit input image. [4]

$$\begin{bmatrix} 10 & 20 & 25 & 10 \\ 21 & 0 & 0 & 29 \\ 54 & 255 & 255 & 21 \\ 21 & 200 & 25 & 21 \end{bmatrix}$$

Write a comment on histogram of input image and histogram of its negative image.

OR

Q4) a) Write the steps used in histogram equalization can two different images have same histogram? Justify your answer. [6]

b) Explain the steps in frequency domain filtering. [4]

Q5) a) State and explain types of redundancies in images. [6]

b) Write the formula used to calculate 2D - DCT of a matrix. Explain why DCT is preferred in image compression. [4]

OR

Q6) a) Generate Huffman code for following image matrix. Calculate efficiency of Huffman code. [6]

$$\begin{bmatrix} 25 & 25 & 25 & 15 \\ 15 & 25 & 25 & 25 \\ 25 & 15 & 15 & 15 \\ 15 & 5 & 5 & 0 \end{bmatrix}$$

b) Draw block diagram of JPEG coder and decoder. Comment on blocksize used in JPEG compression. [4]

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