

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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