Total No. of Printed Pages:2

SUBJECT CODE:- 322
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CSE) Examination Nov/Dec 2015
Digital Image Processing
(Revised)

[Time: Three Hours] **[Max. Marks: 80]**

"Please check whether you have got the right question paper."

N.B i) Question No. 1 and Question No. 6 are compulsory.
ii) Attempt any two questions from the remaining questions from each section.
iii) Assume suitable data if necessary.

Section A

Q.1 Answer the following (any five) 10

a) What are the components of Digital Image Processing System?
b) What are different arithmetic & logical operations applicable to images?
c) What is a fidelity criteria?
d) What is the difference between spatial and frequency domain?
e) What is meant by path?
f) Explain the purpose of Image enhancement.
g) What is entropy?
h) Define sampling and Quantization.

Q.2 a) What is connectivity? Explain different types of adjacency. 08
b) Explain Huffman coding with example. 07

Q.3 a) Differentiate between linear smoothing filter and non linear smoothing filter. 08
b) Explain different types of image compression standards. 07

Q.4 08

a) A 4×4, 4 bits/pixel original image is given by $\begin{bmatrix} 10 & 12 & 8 & 9 \\ 10 & 12 & 12 & 14 \\ 12 & 13 & 10 & 9 \\ 14 & 12 & 10 & 12 \end{bmatrix}$

i) Apply histogram equalization to the image by rounding image pixels to integers.
ii) Sketch the histogram of the original image and histogram equalized image.

b) Explain low pass filter and high pass filter in detail. 07

Q.5 Write short notes (any three) 15

a) Neighbors of pixels.
b) Interpixel Redundancy
c) Applications of image transform
d) Distance measures.

SECTION-B

Q.6 Answer the following (any five) 10

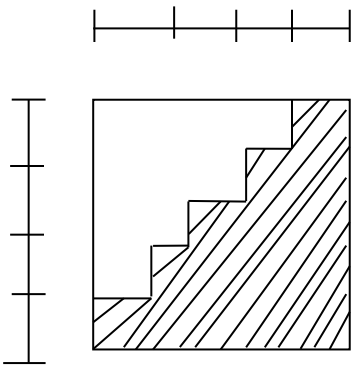
a) What is the role of seed point in region growing process?
b) Differentiate between objective & subjective fidelity criteria.
c) Explain line detection.
d) What is difference between full color image processing and pseudo color image processing.
e) Write a mask of sobel operator and laplacian operator.

f) What is threshold?
g) What is need of structuring element?
h) What is pruning?

Q.7 a) How can hit or miss transformation is used for extracting specific pixel configuration in an image? Give suitable example. 08

b) Explain CMY color model used in Digital Image Processing. 07

Q.8 a) Apply split and merge technique to segment the image below, also represent quadtree representation of the segment. 08



b) Explain morphological reconstruction 07

Q.9 a) Explain region growing technique of segmentation. 08

b) Perform dilation operation A⊕B 07

A= 0 0 1 0 0 0 B = 1
0 0 0 0 1 0 1
0 1 0 0 1 0
0 0 1 1 1 0 1
0 0 0 1 1 1
0 0 0 1 0 1

Q.10 Write short notes (any three) 15

a) Boundary descriptors
b) Local and global thresholding
c) Skeletonization
d) Erosion
e) Chain code