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SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
Second Year, Second Semester Examination – 2016
HNDIT2415-Digital Image Processing

Instructions for Candidates:

No. of questions : 06

Answer 5 Questions Only.

No. of pages : 02

Time : 03 Hours

- 1) a) State the four essential components of image acquisition and processing system. [04 Marks]
- b) Briefly explain the terms “quantization” and “sampling”. [08 Marks]
- c) Distinguish binary, gray, colour and index images. [08 Marks]
- 2) a) What stands for the following graphic file format abbreviations and briefly explain them. [06 Marks]
- i) PNG
- ii) TIFF
- iii) JPEG
- b) Calculate the file size in the following image files. [06 Marks]
- i) 32x32 colour image
- ii) 128x128 gray scale image
- iii) 128x128 binary image
- c) Write the MATHLAB functions with the syntax for the followings. [08 Marks]
- i) Read the image from disk
- ii) Write the image to disk
- iii) Get the size of image
- iv) Convert the colour image to gray scale image
- 3) a) Define the image smoothing and sharpening. [04 Marks]

Please Turn Over

- b) Following matrix defines a 5x5 image. If mean, median, max and min 3x3 filters are applied to the image what would be the value of the center pixel in each case.

3	3	1	2	3
2	3	2	3	4
1	4	6	4	3
3	1	0	2	4
1	2	1	2	2
2	3	5	4	3

[08 Marks]

- c) Apply the following filter to the above image (5x5 matrix) and find the value of the center pixel.

0.4	0.4	0.4
0.4	1	0.4
0.4	0.4	0.4

[08 Marks]

- 4) a) Define the edge of an image.

[02 Marks]

- b) What would be the output image if we filtered the following image by the given filter?



1	1	1
0	0	0
-1	-1	-1

Image(A)

Filter(F)

[08 Marks]

- c) Write down the whole MATHLAB code to white only boarder of the above image

[10 Marks]

- 5) a) Explain the morphological image processing.

[04 Marks]

- b) Explain the erosion, dilation opening and closing with suitable sketch.

[08 Marks]

- c) Write down the MATHLAB function for the above 5 (b) morphological operation.

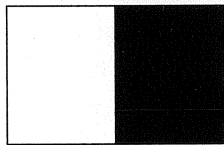
[08 Marks]

- 6) a) What is meant by a histogram?

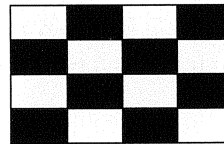
[04 Marks]

- b) What you can say about the histogram of following two images A & B (both 40x40 pixels)?.

Justify your comments.



A



B

[08 Marks]

- c) Draw the histogram of one of the above image.

[08 Marks]