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Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final term Examination, Spring 2023
Course Code: CSE 427, Course Title: Digital Image Processing
Level: 4 Term: 2 Batch: 54

Time: 2 Hrs **Marks: 40**

Answer ALL Questions ***[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially]***

1.	a)	Define edge and **Analyze** the properties of the first and second derivatives around an edge?	[3]	C
	b)	Make some **inferences** on use of thresholding technique in image segmentation.	[3]	
	c)	Let's imagine that you are at the top of the National Stadium to watch one of the prestigious club football programs in the nation. You want to figure out how many people attended the game without manually clicking a tally counter. **Analyze** how Watershed segmentation in image processing helps you to do this job without the help of numerous pre-trained models.	[6]	
2.	a)	How do you **Utilize** the redundant data concepts in image compression? Explain.	[2]	C
	b)	Define Compression and **Construct** a general image compression model.	[3.5]	
	c)	**Apply** Huffman coding to the following source symbols and generate optimal code for the source symbols. Also find out the average number of bits required to represent the code. P(A)=0.2, p(B)=0.1, p(C)=0.2, p(D)=0.05, p(E)=0.3, p(F)=0.05, p(G)=0.1	[4.5]	
3.	a)	**Compare** between structural and statistical pattern recognition with proper example.	[4]	C
	b)	**Distinguish** template-matching models with human pattern recognition. Describe multiple feature-based template matching with example.	[4]	
4.	a)	Consider a sample image, **Make use of** different morphological image operations to the image and explain the resultant effect.	[5]	
	b)	Consider the binary image and structuring element as shown below. **Apply** (i) Dilation and (ii) Erosion operation to the image.	[5]	

EACBGDF

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1	0	0	0	1	0
0	0	0	0	0	1
0	1	1	1	1	0
0	1	1	1	1	1
0	1	1	1	1	0
0	1	1	0	0	1
0	0	0	0	0	0

Image

1
1
1

Structuring Element

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