Exam Date & Time: 10-Jul-2023 (02:30 PM - 05:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.TECH MAKEUP EXAMINATIONS, JULY 2023 DIGITAL IMAGE PROCESSING [CSE 4052]

Ma	rks: 50	Duration: 180	mins
		Ε	
Ans	swer all t	he questions.	
Inst	ructions t	o Candidates: Answer ALL questions Missing data may be suitably assumed	
1)		Explain three types of computerized processes for images	
			(4)
	A)		
	B)	What is contrast stretching? Explain with the graph showing the intensity transformation	(4)
	C)	In the power law transformation, when is the out-pixel value equal to input pixel value? Illustrate with the equation	(2)
2)		How is the analog signal resolved spatially into discrete domain? Explain with a neat diagram	(5)
	A)		
	B)	Enlist the different types of transforms in frequency domain and mention one example for each	(2)
	C)	Write the equation and show the filter through a neat diagram of the Butterworth Low pass Filter in the Frequency domain. Why on the 2D plot of this function, the filter is half cut?	(3)

3) Draw the perspective plot of the following diagram. Assumptions can be mentioned



B) For the following perspective plots of the filter, perceive the radial cross sections how it looks. Properly mention the symbols

(3)



	C)	Estimate the noise density when the probability of salt noise is 50 percent and of pepper noise is 50 percent. What is your inference on this image	(3)
4)		Discuss the steps performed during the non-maximum suppression of Canny edge detector	
	A)		(4)
	A) B)	Recall the basic global thresholding algorithm steps for object segmentation	(3)
	C)	Enlist the advantages and disadvantages of region growing method	(3)
5)		Write the mathematical notations (each 0.5M) for the following morphological image processing.	
		a.A eroded by B	
	A)	b.A dilated by B	
		c.A opened by B	(4)
		d.A closed by B	(1)
		e.A hit or miss by B	
		f.A thinning by B through hit-or-miss	

(4)

B) Apply the structuring element (you can imagine any) and perform the thinning operation on object A. Show only the final output with boundary traced



C) What are the possible four Structuring elements used in convex hull creation in morphological image processing? (2)

-----End-----