Reg No.:_____ Name:_____

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S6 (PT) (S, FE) Examination May 2024 (2015 Scheme)

Course Code: EC370

Course Name: DIGITAL IMAGE PROCESSING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks Marks

1 a) Explain the various elements of digital image processing systems with a suitable diagram. (7)

b) Discuss the terms: (i) Brightness (ii) Hue (ii) Saturation and (iv) Contrast (8)

2 a) Explain any 4 properties of 2D DFT with proof. (10)

b) If $A=\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}$, $B=\begin{bmatrix}1 & 3\\ 3 & 4\end{bmatrix}$, Find the Kronecker product of A and B, as well as B and A, Are they Equal? (5)

3 a) Show that a Circulant matrix is Toeplitz but the converse is not true. (5)

b) Develop Haar Matrix for N=4. (10)

PART B

Answer any two full questions, each carries 15 marks

4 a) Describe the processing of image enhancement techniques in detail in the spatial domain? (10)

b) Compute the median value of the center pixel 5 shown in figure using 3x3 (5)

Mask $\begin{bmatrix}1 & 4 & 7\\ 2 & 5 & 6\\ 3 & 2 & 1\end{bmatrix}$

5 a) Explain the Image Restoration process with necessary diagram. (5)

b) Explain the Wiener filter for image restoration. How is the drawback of inverse filter overcome. (10)

6 a) What is Histogram? How is histogram equalization performed. (7)

b) Briefly explain the basic gray level transformation functions used in digital image processing (8)

PART C

Answer any two full questions, each carries 20 marks

7	a)	Explain the different classification of image segmentation	(10)
	b)	Explain the region based approach to image segmentation.	(10)
8	a)	What is the importance of edges in images, How are edge detection performed in digital images	(10)
	b)	What are the different steps employed in the coding of images using vector quantization	(10)
9	a)	What is the need for compression? What are the different types of redundancies in image compression?	10
	b)	Construct Huffman coding to encode and decode the word "COMMITTEE".	(10)

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