Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

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) Discuss the concepts of Adjacency, Connectivity, Regions and Boundaries among pixels in a digital image (8)

b) State and prove convolution property of DFT (7)

2 a) Discuss the conceptual relationship between the RGB and HSI colour models with neat sketches. (8)

b) Perform KL transform of the following matrix (7)

$$X=\begin{bmatrix} 4 & -2 \\ -1 & 3 \end{bmatrix}$$

3 a) Discuss 2-D sampling theory . How is an image reconstructed from its samples ? (10)

b) What is block toeplitz matrix? Give an example (5)

PART B

Answer any two full questions, each carries 15 marks

4 a) Explain the mechanisms involved in spatial filtering with suitable diagrams? (8)

b) Explain how a degraded image can be restored using an inverse filter. Explain its limitations. (7)

5 a) What are the advantages of filtering in frequency domain? (5)

b) Explain constrained and unconstrained Restoration method (10)

6 a) Describe about histogram processing in images. with example. (8)

b) Explain in detail about minimum mean square error filtering. (7)

PART C

Answer any two full questions, each carries 20 marks

7 a) Utilise Hough transform for global processing (10)

b) Discuss Vector quantization. (10)

8	a)	Define k-means clustering. Outline the algorithm for k-means clustering.	(10)
	b)	Explain the need for image compression.	(5)
	c)	Is the code {0,01,11} uniquely decodable ? Give reasons.	(5)
9	a)	How can edges be detected using second order derivatives?	(10)
	b)	Explain the analytics of Arithmetic Coding based Compression.	(10)

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