Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh semester B.Tech examinations (S), September 2020

Course Code: CS463

Course Name: DIGITAL IMAGE PROCESSING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 4 marks. Marks

1		Explain any two image interpolation techniques.	(4)
2		Define the following terms i) Adjacency ii) Boundary	(4)
3		List any two properties of unitary transform.	(4)
4		Compare image enhancement techniques in spatial domain and frequency domain.	(4)
5		What is the significance of piecewise linear transformation functions?	(4)
6		How order statistics filters are used for image enhancement?	(4)
7		Define multilevel thresholding technique.	(4)
8		Explain different types of edge detection methods.	(4)
9		Compare erosion and dilation with an example.	(4)
10		What is importance of morphological operations in image processing?	(4)

PART B

Answer any two full questions, each carries 9 marks.

11	a)	With a neat block diagram, explain the fundamental steps in digital image processing.	(5)
	b)	Compute 2D DFT for the following image segment $I=\begin{bmatrix}2 & 4\\7 & 3\end{bmatrix}$	(4)
12	a)	Explain the image formation model.	(5)
	b)	Define 1D and 2D Walsh transformation function.	(4)
13	a)	Describe the basic idea of sampling and quantization with a neat sketch.	(5)
	b)	Explain 4 properties of 2D Fourier Transform.	(4)

PART C

Answer any two full questions, each carries 9 marks.

14 a) Describe the steps involved in frequency domain filtering. (5)

b) Explain unsharp masking and high boost filtering. (4)

15 a) Explain the following grey level transformation functions (6)

i) image negatives

ii) Log Transformation

b) Perform histogram equalization of the following 3-bit grayscale image whose gray level distribution is given as follows (3)

Gray Level	0	1	2	3	4	5	6	7
No. of Pixels	8	4	12	3	5	10	2	2

16 a) Explain the following image enhancement techniques in Frequency domain (6)

i) Gaussian High pass filter

ii) Butterworth high pass filter

b) What is the effect of Homomorphic Filtering while enhancing an image? (3)

PART D

Answer any two full questions, each carries 12 marks.

17 a) Write a short note on edge detection. (6)

b) Explain region splitting and merging. (6)

18 a) Describe various thresholding-based segmentation. (8)

b) Explain the concept of Hit or Miss Transformation. (4)

19 a) Explain the following (8)

i) Polygonal approximation approaches

ii) Boundary Segmentation

b) Define Chain Codes. (4)

****