O.P.Code: 20EC0441	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. IV Year I Semester Regular & Supplementary Examinations October/November-2025

DIGITAL IMAGE PROCESSING

(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Discuss the three principal sensor arrangements used to transform illumination energy into digital images.	CO1	L2	6M
	b	List out the applications of digital image processing.	CO1	L1	6M
		OR			
2	a	Compute the array product and matrix product for the following two images and comment the result. $A = \begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -2 \\ -2 & 2 \end{pmatrix}$	CO1	L3	6M
	b	Explain the Array versus Matrix operations on digital images with relevant equations.	CO1	L3	6M

UNIT-II

3	a	Discuss the properties of Unitary transforms.	CO2	L2	6M
	b	Define 1D and 2D – Discrete Fourier Transform with equations.	CO2	L1	6M
		OR			
4	a	Deduce the basis matrix of Walsh Transform for N = 4.	CO2	L4	6M
	b	Calculate Walsh transform for the given image $f(x, y) = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$	CO2	L3	6M

UNIT-III

5	a	Define histogram and draw the histogram four basic image types.	CO3	L1	6M
	b	Explain the procedure for histogram process and uses of histogram.	CO3	L2	6M
		OR			
6	a	Write brief notes on CMY and CMYK color models.	CO3	L1	6M
	b	Explain the method of converting colors from RGB to HSI.	CO3	L2	6M

UNIT-IV

7	a	Draw the degradation/restoration model in image processing and describe each part presented on it.	CO4	L1	6M
	b	Differentiate the Image Enhancement and Image Restoration.	CO4	L4	6M
		OR			
8	a	Illustrate the Clustering techniques for image segmentation with example.	CO5	L2	6M
	b	Discuss the basics of the intensity thresholding.	CO5	L2	6M

UNIT-V

9	a	Discuss the Objective fidelity criteria and subjective fidelity criteria with suitable example.	CO6	L2	6M
	b	Compare zero-memory source and Markov or finite memory source.	CO6	L2	6M
		OR			
10	a	Explain the procedure for Arithmetic coding with suitable example.	CO6	L3	6M
	b	Summarize the procedure of Bit plane coding with suitable example.	CO6	L4	6M

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