# SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
## (AUTONOMOUS)
### B.Tech IV Year I Semester Supplementary Examinations June-2024
## DIGITAL IMAGE PROCESSING
### (Electronics and Communications Engineering)

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

## PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

| | | | | | |
|---|---|---|---|---|---|
| 1 | a | Define image resolution. | L1 | CO1 | 2M |
| | b | What do you mean by fast transforms? | L1 | CO2 | 2M |
| | c | What do you mean by image enhancement? | L1 | CO3 | 2M |
| | d | What do you mean by image enhancement and image restoration? | L1 | CO4 | 2M |
| | e | Define compression ratio. | L1 | CO5 | 2M |

## PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

### UNIT-I

| | | | | | |
|---|---|---|---|---|---|
| 2 | a | What is the need for image processing? List out the fundamental steps in digital image processing which can be applied to images. | L1 | CO1 | 5M |
| | b | List out the various applications of digital image processing. | L2 | CO1 | 5M |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 3 | | Explain about the basic pixel relationships and distance measures between pixels in a digital image. | L2 | CO1 | 10M |

### UNIT-II

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|---|---|---|---|---|---|
| 4 | a | What is the need of image transform? List out various types of transform used in image processing? | L1 | CO2 | 5M |
| | b | Compare the computational complexity and number of operations of all the image transforms. | L2 | CO2 | 5M |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 5 | a | Determine the Hadamard matrix for N =8 using recursive calculation from N=2. | L3 | CO2 | 5M |
| | b | Summarize the properties of Hadamard Transform. | L2 | CO2 | 5M |

### UNIT-III

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|---|---|---|---|---|---|
| 6 | a | Illustrate the image negative transformation with suitable example. | L2 | CO3 | 5M |
| | b | Explain the concept of histogram for various images with relevant diagrams. | L2 | CO3 | 5M |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 7 | a | Discuss about the types of smoothing filters in frequency domain with the required expressions. | L2 | CO3 | 6M |
| | b | Explain about the RGB and CMYK color models. | L2 | CO3 | 4M |

### UNIT-IV

| | | | | | |
|---|---|---|---|---|---|
| 8 | | Discuss the algebraic approach of constrained Least Square filter restoration. | L2 | CO4 | 10M |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 9 | a | Explain the role of thresholding in segmentation. | L2 | CO4 | 5M |
| | b | List the fundamental approaches of edge linking and define the same. | L1 | CO4 | 5M |

10     Explain the following with respect to multi resolution expansions.     L2   CO5   10M
a)Scaling functions     b) wavelet functions

**OR**

11     Explain the following with respect to image compression     L2   CO6   10M
a) Run Length Coding   b) Bit Plane coding

**\*\*\* END \*\*\***