

Roll No: 

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**B.TECH.**  
**(SEM VII) THEORY EXAMINATION 2020-21**  
**DIGITAL IMAGE PROCESSING**

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt all questions in brief. 2 x 10 = 20**

a.	Describe an image with spatial coordinates.
b.	Illustrate the Gray level of an image.
c.	Explain the properties of Hadamard transform.
d.	Outline some of the filters to reduce various noises in an image.
e.	Describe the different approaches for image segmentation.
f.	Compare noisy image with blurred image.
g.	Illustrate why edge detection is most common approach for detecting discontinuities.
h.	Discuss the issues involved for stereo imaging problem.
i.	Outline the operating modes of jpeg format.
j.	Identify the various steps related to high level processing in digital image processing.

**SECTION B**

**2. Attempt any three of the following: 10x3=30**

a.	Explain the concept of image processing components with simple block diagram.
b.	Describe the Image Compression model in detail.
c.	Describe and differentiate the inverse and wiener filter. Discuss the use of wiener filter in image processing. Describe speckle and a method for speckle reduction.
d.	Illustrate why Hadamard Transform is most suitable for digital image processing. Discuss Hadamard Transform with the help mathematical expression.
e.	Discuss edge detection and edge linking. Also write the difference between them.

**SECTION C**

**3. Attempt any one part of the following: 10x1=10**

a.	Discuss and Derive the expression for inverse filtering.
b.	Illustrate how to avoid aliasing effects in an image

**4. Attempt any one part of the following: 10x1=10**

a.	Describe Gaussian noise and illustrate why an averaging filter is used to eliminate it.
b.	Explain Image Enhancement Techniques and discuss the importance of spatial operations.

**5. Attempt any one part of the following: 10x1=10**

a.	Explain sampling and quantization. Illustrate what is the difference between uniform and non-uniform sampling and quantization.
b.	Describe physical aspect of Image Acquisition. Also explain biological aspect of image acquisition.

**6. Attempt any one part of the following: 10x1=10**

a.	Discuss image restoration techniques. Explain in detail the image restoration in presence of noise only.
b.	Discuss the different ways to estimate the degradation function.

**7. Attempt any one part of the following: 10x1=10**

a.	Explain the edge linking using Hough transform.
b.	Discuss and justify that how can you control over segmentation problem.