

Code No: 157BF

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February/March - 2022

DIGITAL IMAGE PROCESSING

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Answer Any Five Questions

All Questions carry equal marks

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- 1.a) Explain the different fundamental steps in image processing with examples.
- b) What is quantization in image processing? Why is it needed? What are the effects of it? [8+7]
- 2.a) How the Discrete Cosine Transform is used to process the digital image? Write its Kernel function.
- b) Determine the KL transform for the following image segment.  
$$\begin{bmatrix} 0001 \\ 0010 \\ 0011 \end{bmatrix}$$
 [7+8]
- 3.a) What is Histogram? Explain Histogram equalization with example.
- b) What is threshold and how to choose threshold value? [7+8]
- 4.a) How median filter is used to remove noise in an image?
- b) Explain how high pass filter is used to sharpen the image. [8+7]
- 5.a) Draw the degradation model and explain how this degradation occurs in an image.
- b) Write about image restoration? Write some examples. [8+7]
- 6.a) Design a Wiener filter for image restoration and discuss its merits and demerits.
- b) What is meant by an interactive restoration? [7+8]
- 7.a) Explain a region growing method to segment an image and what are the drawbacks of this method.
- b) What is meant by hit or miss transformation? How it is used for segmentation of an image? [7+8]
- 8.a) Draw the compression model and explain the function of each block.
- b) Determine the Huffman code for the following image segment and find compression ratio with reference to binary code? [8+7]

2	1	4	5	5	4
2	3	4	1	2	3
2	3	3	4	5	5
2	1	2	3	4	5

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