JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2019
DIGITAL IMAGE PROCESSING
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	Define Image Sampling.	[2]
b)	What is Image Transform? List the applications of Transform.	[3]
c)	What is histogram equalization?	[2]
d)	Write the application of sharpening filters.	[3]
e)	What is inverse filtering?	[2]
f)	Draw the model of image degradation process.	[3]
g)	What is the advantage of using sobel operator?	[2]
h)	How the discontinuity is detected in an image using segmentation?	[3]
i)	What is lossy compression?	[2]
j)	What is the Need for Compression?	[3]

PART - B
(50 Marks)

2. Define 2-D DCT for N=4 and obtain N×N cosine transform matrix and write its
properties and also its applications.   [10]

OR

3.a) Define the following terms with respect to image
i) Distance measure   ii) Connectivity   iii) Neighborhood
b) Derive 4×4 Haar transform.   [6+4]

4. Perform Histogram equalization of an image whose pixel intensity distribution is given
in table.   [10]

Gray Level	0	1	2	3	4	5	6	7
Number of pixels	790	1023	850	656	329	245	122	81

OR

5. What is meant by frequency filtering? Discuss in detail about smoothing and
sharpening frequency filtering.   [10]

6. Explain image degradation model /restoration process in detail. [10]

OR

7. Discuss the interactive restoration methods. [10]

8. What is segmentation? Explain the concept of region based segmentation techniques. [10]

OR

9. Explain the Morphological Erosion and Dilation combination process with one example. [10]

10. Explain how compression is achieved in transform coding with one example. [10]

OR

11. Explain the parts of the JPEG image compression block diagram. [10]

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