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## CS-7004(2)-CBGS

### B.E. VII Semester

Examination, June 2020

## Choice Based Grading System (CBGS)

### Digital Image Processing

*Time : Three Hours*

*Maximum Marks : 70*

- Note:** i) Attempt any five questions (including all parts).  
ii) All questions carry equal marks.  
iii) Assume missing data, if any, suitably.

1. a) Define the following terms:
  - i) Pixel
  - ii) Digital Image
  - iii) Resolution
  - iv) Digital Image Processingb) Explain Sampling and Quantization in detail.
2. a) What is the need of Transform? Explain Hadamard transform.  
b) Define 2D FFT and explain its properties.
3. a) Define Histogram of an Image. Explain the concept of image histogram equalization technique for image enhancement.  
b) Derive the Laplacian of Gaussian (LoG) filter. What purpose does it serve?
4. a) Define the transformation used for scaling and rotating an image about the origin.

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- b) Discuss the procedure for conversion from RGB color model to HIS color model.
5. a) What do you understand by a Sharpening filter? Indicate any one of the sharpening filter that could be used on a gray level image.
- b) Explain how the line is detected in the image and give the masks that are used to detect it.
6. a) Draw and explain the general image compression system model.
- b) Given a  $3 \times 3$  image region in which outer numbers are pixel co-ordinates and the numbers in the brackets represents gray level values. Find the edge segments and their cost in the given image region and edge corresponding to lowest cost path in the graph.

	1	2	3
1	[3]	[6]	[1]
2	[6]	[7]	[0]
3	[7]	[4]	[3]

7. a) What is image segmentation? Explain image segmentation based on Thresholding.
- b) Explain the following morphological algorithms :
- Boundary Extraction
  - Hole filling
8. Write short notes on any three
- Applications of Image processing
  - Lossy compression
  - Dilation and Crosses
  - Image point operations
  - Texture analysis

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