CBCS SCHEME

USN | | | | | | | | | | |

17EC72

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
Digital Image Processing

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain with block diagram, the fundamental steps used in digital image processing. **(10 Marks)**

b. Explain with relevant diagrams, different sensor arrangements. **(10 Marks)**

OR

2 a. Explain the process of sampling and quantization, with relevant diagrams. **(10 Marks)**

b. Define following: (i) Spatial and Intensity Resolution (ii) 4-, 8- and m-adjacency (iii) Euclidean distance, city-block distance and chessboard distance **(10 Marks)**

Module-2

3 a. Explain with plots, some basic intensity transformation functions. **(10 Marks)**

b. With relevant equations, discuss the discrete Laplacian of two variables and different implementation of Laplacian operator masks. **(10 Marks)**

OR

4 a. Discuss with relevant diagrams, the image smoothing using the frequency domain low pass filters (i) Ideal (ii) Butterworth (iii) Gaussian **(10 Marks)**

b. Explain the following selective filter: (i) Bandreject and Bandpass Filters (ii) Notch Filters **(10 Marks)**

Module-3

5 a. Discuss various noise models with respect to image restoration process. **(10 Marks)**

b. Explain the following methods for estimating degradation function: (i) Estimation by image observation (ii) Estimation by experimentation **(10 Marks)**

OR

6 a. Explain the process of restoration of images using Inverse Filtering technique. **(10 Marks)**

b. Explain with relevant equations, Minimum Mean Square Error (Wiener) Filtering. **(10 Marks)**

Module-4

7 a. Explain the following color models: (i) RGB (ii) HSI **(10 Marks)**

b. Explain Pseudocolor Image Processing. **(10 Marks)**

OR

8 a. Explain the following Morphological operations: (i) Erosion (ii) Dilation (iii) Opening (iv) closing **(10 Marks)**

b. Explain multi-resolution expansions used in image processing. **(10 Marks)**

Module-5

9 a. Explain Thresholding based segmentation. Discuss: (i) Global Thresholding (ii) Adaptive Thresholding **(10 Marks)**

b. Explain segmentation of images using Morphological Watersheds. **(10 Marks)**

OR

10 a. Explain Chain Codes used to represent a boundary. **(10 Marks)**

b. Discuss various approaches of boundary description. **(10 Marks)**

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