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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