Seat No_____

# KADI SARVA VISHWAVIDYALAYA

## BE CE/IT SEMESTER – VII (New) EXAMINATION 2025

**SUBJECT CODE: -** CT704C-N **SUBJECT NAME: -** Image Processing

**DATE: 2-April-2025** **TIME: 12:30 PM to 3:30 PM** **MARKS: 70 Marks**

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific calculator is permitted.
3. All questions are **compulsory.**
4. Indicate clearly, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for **rough work.**

## SECTION - I

**Q-1 A** (i) Why is image digitization needed? **[5]**

a) Reduce size, b) Computer processing, c) Increase resolution, d) Enhance color

(ii) Which is NOT a spatial domain enhancement method?

a) Histogram Equalization, b) Gaussian Filtering, c) Fourier Transform, d) Smoothing

(iii) CAT in imaging stands for

a) Computer aided telegraphy, b) Computer aided tomography,

c) Computerized axial telegraphy, d) Computerized axial tomography

(iv) Most used color model in digital image processing?

a) RGB, b) CMYK, c) YUV, d) HSV

(v) Purpose of color transformation is

a) Change brightness, b) Convert color model, c) Reduce size, d) Improve contrast

**B** Explain resolution with image processing. Also define spatial level resolution in detail. **[5]**

**C** Draw a diagram and explain each Fundamental steps in Digital Image Processing. **[5]**

**OR**

**C** State and explain various applications of Digital Image Processing. **[5]**

**Q-2 A** Distinguish between spatial domain techniques and frequency domain techniques of Image Enhancement. **[5]**

**B** Explain about RGB and CMY color models. **[5]**

**OR**

**Q-2 A** Explain the histogram equalization technique in detail. **[5]**

**B** Explain the principle of pseudo color image processing in detail. **[5]**

**Q-3 A** What is m-connectivity among pixels? Give an example. **[5]**

**B** What are the different mean filters used for restoration? Explain any one. **[5]**

**OR**

**Q-3 A** What is meant by image segmentations? Discuss various applications of it. **[5]**

**B** Describe the various noise models in detail. **[5]**

## SECTION-II

**Q-4 A** (i) Which is a lossless compression technique? **[5]**

a) JPEG, b) Huffman Coding, c) MPEG, d) Transform Coding

(ii) What is the main purpose of morphological processing?

a) Compress images, b) Enhance edges, c) Extract structures, d) Color transformation

(iii) What is the basis for numerous spatial domain processing techniques??

a) Transformations, b) Scaling, c) Histogram, d) Closing

(iv) Edge detection is based on?

a) Uniform intensity, b) Intensity changes, c) Grayscale conversion, d) Reducing resolution

(v) Common edge detection method?

a) Huffman Coding, b) Fourier Transform, c) Sobel Operator, d) Quantization

**B** Write a note on Image sensing and Acquisition? **[5]**

**C** Distinguish between digital image, and binary image. Give suitable example to each type of images. **[5]**

**OR**

**C** What are the components of an image processing system? **[5]**

**Q-5 A** Explain the Image compression models. **[5]**

**B** Explain Arithmetic coding and its advantages over Huffman coding. **[5]**

**OR**

**Q-5 A** Explain Hole Filling and Connected Component Analysis. **[5]**

**B** What is Thresholding? Explain about Global Thresholding in detail. **[5]**

**Q-6 A** How does edge detection help in segmentation? Explain with examples. **[5]**

**B** Compare region-based and edge-based segmentation methods. **[5]**

**OR**

**Q-6 A** Describe the Hough transform and its application in segmentation. **[5]**

**B** Explain various morphological operations in details. **[5]**