BCA-7-03T: Digital Image Processing

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 4
Pass Percentage: 40%

INSTRUCTIONS FOR THE PAPER SETTER/EXAMINER

1. The syllabus prescribed should be strictly adhered to.
2. The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
3. Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Course: Digital Image Processing	
Course Code: BCA-7-03T	
Course Outcomes (COs)	
After the completion of this course, the students will be able to:	
CO1	Define digital images and understand the principles of image representation, including pixel values, color spaces, and image formats.
CO2	Gain proficiency in basic image enhancement techniques, including contrast enhancement, brightness adjustment, and histogram equalization.
CO3	Understand advanced enhancement techniques, such as spatial domain filtering, frequency domain filtering, and adaptive enhancement methods.
CO4	Gain an understanding of image compression techniques to reduce storage space and transmission bandwidth requirements.
CO5	Develop skills in image segmentation techniques for partitioning images into meaningful regions or objects.

Detailed Contents:

Module	Module Name	Module Contents

Section-A		
Module 1	**Introduction to image processing**	Introduction to image processing: • Fundamentals • Applications • Image processing system components • Image sensing and acquisition • Sampling and quantization • Neighbors of pixel adjacency connectivity • Regions and boundaries • Distance measure
Module II	**Image Enhancement**	Image Enhancement: • Frequency and Spatial Domain • Contrast Stretching • Histogram Equalization • Low pass and High pass filtering
Section-B		
Module IV	**Color Image Processing**	Color Image Processing: • Color models • Pseudo color Image processing • Color transformation and segmentation.
Module V	**Image Compression**	Image Compression: • Fundamentals • Models • Error free and lossy compression • Standards.

Books

1. Rafel C. Gonzalez and Richard E. Woods, "Digital Image Processing", 2nd Edition, Pearson Education

2. Bhabatosh Chanda and Dwijesh Majumder, "Digital Image Processing", PHI

3. Anil K Jain, "Fundamentals of Digital Image Processing", PHI

4. Rafel C. Gonzalez and Richard E. Woods, "Digital Image Processing using MATLAB", 2nd Edition, Pearson Education