



SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2024-2025

SLOT: G2+TG2

Programme Name & Branch : BTECH, ALL
Course Code and Course Name : BCSE323L, DIGITAL WATERMARKING AND STEGANOGRAPHY
Faculty Name(s) : Dr. Akila Victor
Class Number(s) : VL2024250501612
Date of Examination : 02. Feb. 2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- Assume Values when not given.
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyze, 5 - Evaluate, 6 - Create)
 1. To understand the basic principles, characteristics, various approaches and applications of digital watermarking and steganography.
 2. To apply digital watermarking techniques as an authentication tool for distribution of content over the Internet and steganography techniques for covert communication.

Q. No	Question	M	CO	BL
1	Explicate the definition of watermarking in detail. Explore its various types and explain each one with real-world examples to illustrate how they function and where they are typically applied.	10	1	1
2	Elucidate the concept of error correction codes and provide a detailed analysis of the Trellis and Viterbi algorithms, highlighting their roles in encoding, decoding and error correction in communication systems	10	1	2
3	How do correlation-based watermarking and least significant bit (LSB) watermarking stack up against each other? Break down their differences, and illustrate each method with concrete examples to highlight how they operate and their strengths or weaknesses.	10	1	6
4	$\begin{matrix} & 4 & 2 & 1 \\ \text{For the } 3 \times 3 \text{ image } f(x,y) = & 7 & 3 & 0 \\ & 1 & 11 & 5 \end{matrix}$ a) Apply the Discrete Fourier Transform (DFT) watermarking technique to the above image ? Illustrate its application and analyse the results to reveal how it alters the embedded image or signal, and what effects it has on robustness and perceptibility	10	2	3



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5.	What happens when you embed a watermark using the Haar Transform? Discuss the process of applying it to an image, and then break down the resulting effects—how does it impact the image's quality, and how resilient is the watermark against various distortions? $f(x, y) = \begin{matrix} & \begin{matrix} 56 & 12 & 61 & 88 \\ 98 & 59 & 62 & 100 \\ 63 & 60 & 134 & 58 \\ 90 & 212 & 85 & 176 \end{matrix} \end{matrix}$	10	2	3
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