BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Sc.(ANCS)-Hons-2022
Course Name – Digital Watermarking and Steganography
Course Code - BNCSD502A
(Semester V)

Time : 2:30 Hours

Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Which of the following is NOT an issue in steganography?
a) Security b) Capacity
c) Imperceptibility d) Compression

(ii) What is steganalysis?
a) The process of embedding secret data b) The analysis of stegosaurus fossils
c) The detection of hidden data d) The creation of secure keys

(iii) Identify the primary difference between active and passive steganalysis.
a) Active involves probing b) Active requires tools
c) Passive relies on noise d) Passive uses encryption

(iv) In steganography, what is the primary goal of watermark security and authentication?
a) Ensuring data integrity b) Detecting hidden data
c) Concealing information d) Encrypting messages

(v) Which of the following type of attack involves altering the geometric properties of a watermarked image?
a) Geometric Compression b) Frequency-domain attack
c) Remodulation attack d) Linear Compression

(vi) Which type of watermarking is based on the characteristics and applications of the data?
a) Spatial-domain b) Frequency-domain
c) Vector quantization-based d) Geometric compression

(vii) What are the three main frameworks for secret communication in steganography?
a) Pure, secret key, public b) Audio, video, images
c) Steganalysis, detection d) Active, passive

(viii) Identify, which type of steganography technique involves altering the spatial characteristics of an image.

a) Spatial-domain b) Frequency-domain
c) Transform-domain d) Spread spectrum

(ix) Which domain does the frequency-domain watermarking primarily operate in?

a) Frequency domain b) Spatial domain
c) Vector quantization d) Geometric domain

(x) Which type of steganography algorithm adapts based on the properties of the cover media?

a) Adaptive b) Statistical
c) Substitution d) Fixed

(xi) What is the main purpose of digital watermarking in multimedia files?

a) Ensuring copyright protection b) Compressing data
c) Encrypting files d) Protecting against malware

(xii) What is the primary weakness of spatial domain steganography techniques?

a) Limited to small payloads b) High computational cost
c) Vulnerability to compression and noise d) Slow execution

(xiii) Which steganographic technique spreads hidden data across multiple channels in a media file?

a) Spread spectrum b) LSB embedding
c) Substitution d) Huffman coding

(xiv) What is the most common steganographic technique used in modern digital images?

a) LSB (Least Significant Bit) embedding b) Echo hiding
c) Substitution cipher d) Temporal masking

(xv) In audio steganography, which method is used to embed secret data in audio signals?

a) Phase encoding b) Substitution
c) Echo hiding d) Temporal masking

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe the steganalysis technique that focuses on scrutinizing the least significant bits (LSBs) of a cover medium. (3)
3. Clarify the purpose of utilizing spread spectrum techniques in steganography. (3)
4. Describe the steganography technique centered on replacing certain elements of the cover medium with hidden data. (3)
5. What is the core concept of steganography, and how does it contrast with cryptography? (3)
6. Evaluate the significance and implications of spread spectrum steganography. (3)

OR

Assess the effectiveness and implications of statistical steganography techniques. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Categorize the common applications of Digital Watermarking. (5)
8. Determine the role of Message Coding in Watermarking Systems. (5)
9. Evaluate examples of Perceptual Models used in watermarking. (5)
10. Critique the use of Selective Authentication in Watermarking. (5)

11. Describe how watermarking with error correction coding enhances security and robustness. (5)
12. Evaluate how Geometric Models apply to Watermarking. (5)

OR

Critique the Security Requirements for Watermarking Systems. (5)

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