BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – M.Sc.(ANCS)-2022
Course Name – Steganography
Course Code - MNCS304A
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[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) Identifying 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) What are the frameworks for secret communication in steganography?
a) Secret handshakes b) Pure Steganography, secret key, public key steganography
c) Morse code d) Public announcements

(iv) What are steganography algorithms primarily responsible for?
a) Sending messages over the internet b) Hiding secret keys
c) Embedding secret data within cover media d) Performing complex calculations

(v) What distinguishes adaptive steganography algorithms from non-adaptive ones?
a) Adaptive algorithms are more expensive b) Non-adaptive algorithms change their behavior based on data
c) Adaptive algorithms adjust to the cover media d) Non-adaptive algorithms are always invisible

(vi) What are substitution systems in steganography?
a) Replacing letters with numbers b) Replacing data with equivalent data
c) Replacing entire messages with random characters d) Exchanging keys between parties

(vii) What is the primary focus of spatial domain steganography techniques?
a) Manipulating data in the frequency domain. b) Altering data in the spatial domain.
c) Analyzing data statistically. d) Creating digital watermarks.

(viii) What does LSB embedding refer to in steganography?

a) Embedding data in the least significant bits of cover media
b) Embedding data in the most significant bits of cover media
c) Replacing all bits of cover media with secret data
d) Embedding data in the middle bits of cover media

(ix) Which of the following is a statistical steganography technique?

a) Spatial domain steganography
b) Frequency domain steganography
c) Spread spectrum steganography
d) Texture-based steganography

(x) What are the different types of watermarking techniques?

a) Typesetting and graphic design
b) Spatial domain, frequency domain, and vector quantization-based watermarking
c) Watercolor painting techniques
d) Audio and video editing

(xi) What does the term "imperceptibility" refer to in steganography?

a) The ability to detect hidden data
b) The inability to hide data effectively
c) The quality of hidden data being undetectable by human senses
d) The process of data compression

(xii) Define the primary objective of steganography.

a) To encrypt data
b) To hide data
c) To compress data
d) To transmit data faster

(xiii) Explain the term used to describe the procedure of detecting and eliminating hidden data from a carrier medium.

a) Steganography
b) Steganalysis
c) Cryptography
d) Encryption

(xiv) Provide an example of a passive steganalysis attack and describe how it works.

a) Modifying the stego key
b) Analyzing statistical properties of the carrier
c) Intercepting the stego communication
d) Embedding data in a cover medium

(xv) Compare and contrast active steganalysis attacks with passive steganalysis attacks.

a) Passive steganalysis
b) Active steganalysis
c) Malicious steganalysis
d) Covert steganalysis

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. Define the abbreviation LSB in LSB Embedding. (3)
4. Compare and contrast active and passive steganalysis approaches. (3)
5. Appraise spatial domain techniques in steganography by providing an illustrative example. (3)
6. Explain the aspect analyzed by texture-based steganalysis techniques. (3)

OR

Elaborate on the steganalysis technique relying on statistical analysis of a cover medium for detecting hidden data. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Define Steganography and briefly explain its history. (5)
8. What are the key methods used for hiding information in steganography? Discuss the methods for hiding text, images, audio, and video. (5)
9. What are some common attacks on digital watermarks, and how can watermark security and authentication be ensured? (5)

10. Provide a case study of LSB embedding and LSB Steganalysis using primary sets. Explain how these techniques can be used and detected in practice. (5)
11. Explain the concept of vector quantization-based watermarking in digital watermarking. How does it work, and what are its advantages? (5)
12. What is the role of steganalysis in ensuring the security of information transmission? (5)

OR

How can the imperceptibility of steganographic changes be maintained while achieving high capacity for hidden messages? (5)

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