# BRAINWARE UNIVERSITY

### Term End Examination 2024-2025
### Programme – M.Sc.(ANCS)-2021/M.Sc.(ANCS)-2022/M.Sc.(ANCS)-2023
### Course Name – Biometric Security
### Course Code - MNCS304B
### ( 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) Select the primary function of AFIS technology.

a) One-to-one authentication
b) Large-scale fingerprint identification
c) Behavioral biometric analysis
d) Retinal pattern matching

(ii) Decide the strength of signature-scan technology.

a) Resistance to imposters
b) Requirement for specialized devices
c) Inconsistent signatures
d) Limited applications

(iii) Judge the weakness of keystroke-scan technology.

a) Leverages existing hardware
b) Adds convenience
c) Still in the formative stage
d) Requires physical signatures

(iv) Select the primary purpose of an Automated Fingerprint Identification System (AFIS).

a) One-to-one authentication
b) Behavioral biometric analysis
c) Large-scale fingerprint identification
d) Facial recognition in public places

(v) Decide the primary function of a one-time password (OTP) in 2FA.

a) To provide a long-term password
b) To identify the user by fingerprint
c) To offer a temporary, one-time code
d) To store biometric data

(vi) Which of the following is an example of a behavioral biometric?

a) Fingerprint
b) Iris pattern
c) Voice recognition
d) Hand geometry

(vii) Select the scenario for which the facial recognition technology most likely to face challenges.

a) Low lighting conditions
b) High-speed internet
c) Short distances
d) Stable environments

(viii) Relate the following scenarios that best describes biometric identification.

a) A user logging into their phone using a fingerprint scanner.
b) A security system identifying a person from a database using their voice.
c) A person entering a PIN at an ATM.
d) An email account requiring a password.

(ix) Contrast between static and dynamic signature biometrics:

a) Static signatures record only the visual appearance of the signature, while dynamic signatures capture behavioral data like speed and pressure.

b) Static signatures are more secure than dynamic ones.

c) Dynamic signatures only work with touch-based devices.

d) Static signatures require real-time input, while dynamic signatures do not.

(x) Choose the duration of processing a DNA sample for biometric purposes.

a) A few seconds

b) Several minutes

c) A few hours Several days

(xi) Which of the following features is measured in hand scan biometrics?

a) Finger lengths and widths

b) Skin color

c) Nail patterns

d) Fingerprint ridges

(xii) Choose an advantage of hand scan biometrics.

a) Low cost and ease of implementation

b) Requires advanced cameras

c) Highly accurate for identifying identical twins

d) Cannot be used in public spaces

(xiii) Determine finger-scan systems.

a) image acquisition hardware

b) image processing components

c) storage components

d) All of the these

(xiv) Relate artificial intelligence (AI) typically used in biometric systems.

a) To create random user data

b) To enhance pattern recognition and decision-making

c) To generate synthetic fingerprints

d) To replace traditional hardware

(xv) Relate the primary advantage of combining biometrics with cryptographic techniques.

a) Increased computational efficiency.

b) Enhanced security and privacy of biometric data.

c) Reduced cost of biometric systems.

d) Elimination of false positives in matching.

## Group-B
### (Short Answer Type Questions)

3 x 5=15

2. Define keystroke dynamics. (3)
3. Construct the Eigenface technology used in facial recognition. (3)
4. Analyze the strength of the facial scan. (3)
5. Utilize DNA biometrics in identification systems. (3)
6. Judge fingerprint scans a widely adopted biometric authentication method. (3)

**OR**

Estimate the primary biometric trait used in a fingerprint scan. (3)

## Group-C
### (Long Answer Type Questions)

5 x 6=30

7. Explain the process of a voice scan for biometric security and discuss its advantages and limitations. (5)

8. Summarize the limitations and challenges associated with iris recognition, and how do these affect its deployment in various applications? (5)

9. Predict the concept of One-Time Passwords (OTPs) as a component of Two-Factor Authentication. Explain how OTPs work and their advantages in enhancing security. (5)

10. Describe Ultrasound technology in detail. (5)

11. Explain Eigenface technology. (5)

12. Estimate the strengths of iris recognition technology, particularly its high accuracy and stability of characteristics over time. (5)

**OR**

Select the key components of an iris recognition system and their functions in capturing (5)
and processing iris images.

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