Enrollment No......................................

Faculty of Science
End Sem Examination Dec-2023
FS3SE06 Digital Biometry

Programme: B.Sc. (Hons.)   Branch/Specialisation: Forensic Science

Duration: 3 Hrs.   **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. _____ is a branch of information technology that aims towards establishing one's identity based on personal traits.   **1**
(a) Control systems   (b) Biometrics
(c) Convex optimization   (d) Pulse

ii. Biometrics is a technology used to _____ an individual's physical and behavioral characteristics.   **1**
(a) Identify   (b) Analyze
(c) Measure   (d) All of these

iii. _____sense the temperature differences on the contact surface, in between fingerprint ridges and valleys.   **1**
(a) Thermal scanners   (b) Meta dermal scanners
(c) UV scanners   (d) None of these

iv. The recognition of fingerprint pattern is based on_____.   **1**
(a) Minutiae's   (b) Patterns
(c) Skin   (d) Both (a) and (b)

v. Pixels with intensity levels above the threshold are classified as white, while those below the threshold are classified as_____   **1**
(a) Black   (b) Blue   (c) Brown   (d) Green

vi. In histogram graph the horizontal axis represents tonal variations whereas vertical axis represents the _____   **1**
(a) Number of pixels   (b) Number of lines
(c) Number of area   (d) Both (a) and (b)

vii. Which is the correct mechanism of iris recognition? **1**
  (a) Take a photography- clip out the iris part- block division-converted into feature values-perform matching.
  (b) Take a photography-clip out the iris- perform matching
  (c) Take a photography-block division- clip out the iris- perform matching
  (d) Take a photography- converted into feature values-perform matching-clip out the iris

viii. The iris is the colored, _____portion of the eye behind the cornea. **1**
  (a) Donut-shaped
  (b) Leaf shape
  (c) Patels shape
  (d) None of these

ix. Behavioural biometrics analyzes a user's digital physical and _____behaviour. **1**
  (a) Cognitive   (b) Voluntary
  (c) Covert   (d) Both (a) and (b)

x. Signature recognition is an example of _____biometrics that identifies a person based on their handwriting. **1**
  (a) Behavioural   (b) Cognitive
  (c) Voluntary   (d) None of these

Q.2 i. Define biometrics and explain the characteristics of a good biometric system. **2**

ii. Explain the working principle of automated fingerprint identification systems with block diagram. **3**

iii. Explain the key biometric processes. **5**

OR iv. Explain about the voice scan and retina scan biometrics. **5**

Q.3 i. What is fingerprint biometric? Explain its advantages. **2**

ii. Explain the following- fingerprint patterns, fingerprint features, fingerprint image and width between two ridges. **8**

OR iii. Explain in detail fingerprint image processing. **8**

Q.4 i. Explain in brief about the - fundamental steps in image processing and image enhancement. **3**

ii. What is image segmentation? Explain in detail. **7**

OR iii. What is gradient based segmentation? Explain in detail. **7**

Q.5 i. Explain the iris system architecture. **4**

ii. Explain the followings- **6**
  (a) Iris recognition   (b) Location
  (c) Doubly dimensionless   (d) Projection

OR iii. Explain in detail about the coordinate system of iris. **6**

Q.6 Attempt any two:

i. Explain the working principles and components of signature-scan – keystroke scan. **5**

ii. Give your view on privacy and standards in biometrics. **5**

iii. Write about the sympathetic biometric systems – need for standards – different biometric standards. **5**

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