SRM Institute of Science and Technology
College of Engineering and Technology
School of Computing

Mode of Exam
OFFLINE

DEPARTMENT OF COMPUTING TECHNOLOGIES

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2032-2024 (ODD/EVEN)

Test: CLAT-3 **Date: 9. 11.2023**
Course Code & Title: 18CSE357T-Biometrics (Elective) **Duration: 100 minutes**
Year & Sem: 3 & 4 Year/5 &7 Sem **Max. Marks:** 50

Course Articulation Matrix: *(to be placed)*

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	3	3	3	-	-	3	-	-	-	-	-	-	-	-
CO2	3	3	3	3	-	-	3	-	-	-	-	-	-	-	-
CO3	3	2	2	2	-	-	2	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	3	2	3	-	-	-	-	-	-	-
CO5	3	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO6	3	3	3	3	-	-	3	-	-	-	-	-	-	-	-

Part - A
(10 × 1 = 10   Marks)
Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	In Biometric Systems, which among the following trait is classified as a physiological biometric trait? (a) Gait (b) Voice (c) Signature (d) Hand Geometry **Ans: d – Hand Geometry**	1	1	4	1	1.6.1*
2	MRI images can also be used for biometric applications like identification or verification. MRI image based biometric systems are classified as _____ (a) Hard Biometrics (b) Soft Biometrics (c) Hidden Biometrics (d) Behavioral Biometrics **Ans: c – Hidden Biometrics**	1	1	4	1	1.6.1
3	When the resource of a biometric system is shared for another united application or purpose, the resultant security threat is termed as _____ (a) Denial of Service (b) Intrusion (c) Repudiation. (d) Function Creep **Ans: d – Function Creep**	1	1	4	4	1.6.1
4	Adversarial attack on communication infrastructure of biometric systems for compromising the system confidentiality is termed as _____ (a) Exception Abuse (b) Spoofing (c) Expoit faults (d) Man-in-the-middle attack **Ans: d – Man-in-the-middle attack**	1	1	4	2	1.6.1

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5	The condition of the data being complete and unaltered is referred as _____ (a) Confidentiality (b) Integrity (c) non-repudiation (d) Availability **Ans: b - Integrity**	**1**	**1**	**4**	**1**	**1.6.1**
6	Automated Border Control Technology (eGates) are biometric based solutions to _____ (a) Access control to weapon systems (b) Online Shopping (c) Immigration (d) Banking **Ans: c - Immigration**	**1**	**1**	**5**	**2**	**1.6.1**
7	Audio visual tracking-based person recognition system is highly resilient to which among the following type of adversarial attack? (a) Repudiation (b) Function Creep (c) Spoofing (d) Exception abuse **Ans: c - Spoofing**	**1**	**1**	**5**	**2**	**1.6.1**
8	Biometric Integration to Programmable Logic Controllers offer which among the following benefits? (a) Improves the, computational efficiency of Programmable Logic Controllers (b) Can setup access schedule on PLC for specific users (c) Makes PLC safer for operation (d) Improves the maintainability of PLC **Ans: b – can setup access schedule on PLC for specific users**	**1**	**1**	**5**	**1**	**1.6.1**
9	Among the following electronic equipment manufacturing companies, a major player in Biometric market place is _____ (a) Harman (b) Synaptic (c) Asus (d) Hewlett-Packard **Ans: b - Synaptic**	**1**	**1**	**5**	**1**	**1.6.1**
10	Individuals professing hacker skills and using them for defensive purposes (like Security Analysts) are also termed as (a) Black hats (b) Green hats (c) White hats (d) Grey hats **Ans: c – White hats**	**1**	**1**	**5**	**2**	**1.6.1**
	Part – B **(5× 2 = 10 Marks)** **Instructions: Answer any five**					
11	What is insider attack? List the ways by which insider attack can be mounted on a biometric system. - Insider (authorized user of a biometric system, which includes both system administrators) turns malicious and intentionally subverts system **(1 marks)** - Collusion, Coercion, Negligence, Enrollment Fraud, Exception Abuse **(1 mark)**	**2**	**2**	**4**	**2**	**1.6.1**

12	Distinguish between Sabotage and Overloading of biometric systems **Sabotage** - Sabotage usually involves physical damage to one or more components of the biometric infrastructure **(1 mark)** **Overloading** is an attempt to defeat the system by overwhelming it with authentication requests **(1 mark)**	2	2	4	2	1.6.1
13	Discuss the properties essential for Cryptographic Hash function. **Preimage Resistance** – Give hashed password h(x), computationally hard to find y such that h(y) = h(y) **(1 mark)** **Weak Collision Resistance** – Given x and h(x), computationally hard to find y, such that y ≠ x and h(x) = h(y) **(1 mark)** **Collision Resistance** – Computationally hard to find arbitrary x and y such that x ≠ y, but h(x) = h(y) **(1 mark)**	2	2	4	2	1.6.1
14	What are the possibilities of using biometric systems in welfare distribution? Ration distribution explanation **(1 mark)** Fund/Scholarship distribution explanation **(1 mark)** Disaster Relief distribution explanation **(1 mark)**	2	3	5	3	1.6.1
15	Compare between Sensor fusion and Decision fusion Sensor Fusion: Also known as data fusion is combining of sensory data **(1 mark)** Decision Fusion: Combines the decisions of multiple classifiers into a common decision **(1 mark)**	2	3	5	3	1.6.1
16	State the characteristics of embedded systems. A combination of a computer processor, computer memory, and input/output peripheral devices—that has a dedicated function within a larger mechanical or electrical system **(2 marks)** - Real time computational constraints **(1 marks)**	2	2	5	3	1.6.1
Part – C						

Part – C
(15× 2 = 30   Marks)
Instructions: Answer all

17	What are the various attacks that can be mounted on the user interface of a biometric System? If you are assigned with the task of designing the biometric system, what are the countermeasures you employ to mitigate the attacks on the user interface. Discuss in detail **Attacks (7 marks)** Impersonation, Obfuscation, Spoofing **Countermeasures (8 marks)** Spoof Detection- Three approaches- Physiological, behavioral actions, challenger response,	15	4	4	3	1.6.1
	(or)					
18	Template database of biometric systems is vulnerable to attacks, targeting with multiple objectives. Discuss the various objectives and the threat categories. Explain the different countermeasures that can be employed to ensure the confidentiality and integrity of template databases. **Attacks (8 marks)** First attack, Second attack, Collusion, covert acquisition, brute-force, template leakage,		4	4	3	1.6.1

	Countermeasures (8 marks) Cryptographic functions, Encryption, AES, RSA, Hash Function					
19	What are Programmable Logic Controllers? Explain the process and benefits involved in the integration of Biometric in Programmable Logic Controllers for Industrial automation. Also explain embedded systems and their application in biometrics. **PLC (8 marks)** PLC Definition, PLC Advantages PLC Integration methods **Embedded Systems (7 marks)** Definition, Benefits Examples	15	3	5	3	1.6.1
	(or)					
20	Discuss in detail gesture recognition systems, their categories and their application in various Information Technology sectors. Online Gesture Recognition and applications (**8 marks**) Offline Gesture Recognition and applications (**7 marks**)	15	3	5	3	1.6.1

*Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions
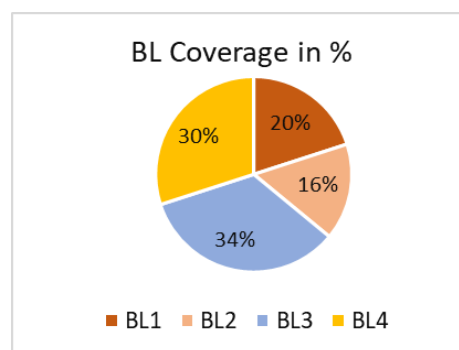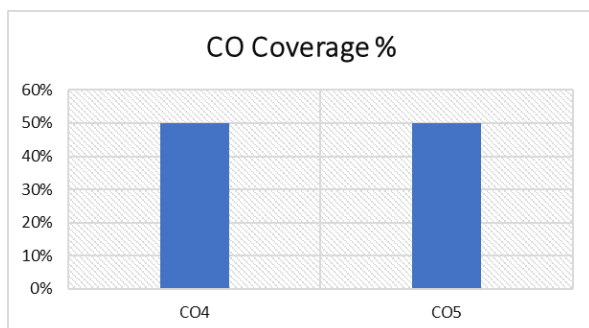
Approved by the Audit Professor/Course Coordinator