R22 Regulation *Subject code: 4P5FD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular/Supplementary Examinations, November 2025

BIOMETRICS

(IT)

Maximum Marks: 60 Date:12.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A	Marks	CO	Bloom Tx
All the following questions carry equal marks (10X1M=10 Marks)				
1.a)	What is the main objective of biometric systems?	1M	1	L1
b)	Why are biometrics considered more secure than PINs?	1M	1	L1
c)	List any two applications of face biometrics.	1M	2	L2
d)	Define FRR in biometrics.	1M	2	L1
e)	State one challenge in designing a retina biometric system.	1M	3	L2
f)	How does the non-contact nature of iris biometrics improve user experience?	1M	3	L2
g)	List two biometric traits used in hand-based biometrics.	1M	4	L2
h)	What is the purpose of the SIFT algorithm in gesture recognition?	1M	4	L1
i)	How can unauthorized access to biometric databases affect users?	1M	5	L2
j)	Mention one challenge in implementing biometric cryptography.	1M	5	L1
	Part-B			
Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Describe the general architecture of a biometric system. Explain the function of each component in the system.	10M	1	L2
	OR			
3	List and explain various real-world applications of biometric systems across different sectors.	10M	1	L2
4	a) How has face recognition evolved from traditional to AI-based systems? b) Describe the process flow of a face recognition system from image capture to identity verification.	5M 5M	2	L2 L2
	OR			
5	a) Discuss spoofing attacks and how they pose a threat to face biometric systems. b) Compare different face recognition methods like PCA, LDA, and LBP.	5M 5M	2	L2 L4

6	Explain the complete iris segmentation process in an iris recognition system. Why is segmentation crucial, and what errors can occur during this process?	10M	3	L2
	OR			
7	Discuss the importance of experimental analysis in iris localization. Present a hypothetical or real example showing the performance evaluation of a localization algorithm.	10M	3	L2
8	a) Describe the hardware and software components required for palm vein biometric systems. b) Explain the role of image preprocessing and feature extraction in fingerprint recognition.	5M 5M	4	L2 L2
	OR			
9	a) Describe the steps involved in indexing fingerprints for fast retrieval. b) Compare the advantages and disadvantages of contact-based and contactless biometric systems.	5M 5M	4	L2 L2
10	Critically analyze how biometric systems impact individual rights and personal freedoms in terms of identity and privacy.	10M	5	L3
	OR			
11	Discuss the privacy implications of using soft biometrics such as age, gender, height, or ethnicity in biometric systems.	10M	5	L2