

Total No. of Questions: 6

Total No. of Printed Pages:3



Enrollment No.....

Faculty of Science

End Sem (Odd) Examination Dec-2022

FS3SE06 Digital Biometric

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.

- Q.1 i. Which of the following techniques is used for facial recognition? 1  
(a) Video-superimposition (b) Video comparator  
(c) NGS (d) ESDA
- ii. Which of the following is an example of a behavioural biometric? 1  
(a) Thermogram (b) Skin reflectance  
(c) Retina (d) Lip motion
- iii. The point where a friction ridge begins, terminates, or splits into two or more ridges. Is known as- 1  
(a) Friction ridge (b) Bifurcation  
(c) Ridge ending (d) Minutiae
- iv. Image of an object taken from an infrared camera which shows surface temperature variations. 1  
(a) Threshold (b) Thermograms (c) Thermostats (d) None of these
- v. What is Digital Image Processing? 1  
(a) It's an application that alters digital videos.  
(b) It's a process that allows altering digital pictures.  
(c) It's a system that manipulates digital medias.  
(d) It's a machine that allows altering digital images.
- vi. Which of the following is the first and foremost step in Image Processing? 1  
(a) Image acquisition (b) Segmentation  
(c) Image enhancement (d) Image restoration
- vii. A biometric trait that uses an image of the physical structure of an individual's iris for identification purpose is known as- 1  
(a) Iris recognition (b) Iris scanning  
(c) Iris capture (d) None of these

P.T.O.

[2]


- viii. The CORRECT sequence of the process in a biometric recognition system is: **1**  
 A. Acquisition  
 B. Feature selection  
 C. Feature extraction  
 D. Identification / Verification  
 E. Performance evaluation  
 Choose the correct answer from the options given below  
 (a) A, C, B, D, E (b) A, B, C, D, E  
 (c) A, B, D, C, E (d) A, D, B, C, E
- ix. Contrast to physiological biometrics, which of the following is an example of a behavioural biometric? **1**  
 (a) Face (b) Fingerprint (c) Retina (d) Signature
- x. The keystroke biometric is: **1**  
 (a) A physiological biometric and one of the six commonly used biometrics  
 (b) A behavioral biometric and one of the six commonly used biometrics  
 (c) A physiological biometric but not one of the six commonly used biometrics  
 (d) A behavioral biometric but not one of the six commonly used biometrics
- Q.2 i. Define the term false match rate? Distinguish between Single false match rate versus System false match rate. **3**  
 ii. Describe the benefits of biometrics over traditional authentication systems. **7**  
 OR iii. Write note on applications of biometric security system. **7**
- Q.3 i. How to access the quality of fingerprint? **2**  
 ii. Explain fingerprint image processing and matching. **8**  
 OR iii. What are the different features that are used in finger-scan biometric approach? Explain. **8**
- Q.4 i. What is a digital image? Explain about RGB colour model. **3**  
 ii. What do understand by histogram of an image? Explain all the histogram-based image enhancement techniques. **7**

[3]

- OR iii. What is image segmentation? Explain all the gradient-based edge detection methods. **7**
- Q.5 i. What are the differences between ANSI and ISO data format specifications for iris record? **4**  
 ii. What do you understand by iris image quality? Explain all the quality metric presented in Pentagram plot. **6**  
 OR iii. What is retinal scan biometric approach? Discuss its working functionalities. **6**
- Q.6 Attempt any two:  
 i. Write a short note on keystroke biometric. **5**  
 ii. Describe the types of algorithms used for voice interpretation. **5**  
 iii. Why no biometric approach is 100% accurate? Derive the different factors that affect the recognition performance. **5**

\*\*\*\*\*

# Scheme of Marking

 <b>MEDI-CAPS</b> <b>UNIVERSITY</b> Knowledge Is Power	Faculty of Science End Sem (Odd) Examination Dec-2022 Digital Biometry (FS3SE06)		
	Programme: B.Sc.	Branch/Specialisation:	

**Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.**

Q.1	i)	Which of the following techniques is used for facial recognition? a) Video-superimposition	1		1
	ii)	Which of the following is an example of a behavioural biometric? d) Lip motion	1		1
	iii)	The point where a friction ridge begins, terminates, or splits into two or more ridges. Is known as- b) Bifurcation	1		1
	iv)	Image of an object taken from an infrared camera which shows surface temperature variations. b) Thermograms	1		1
	v)	What is Digital Image Processing? b) It's a process that allows altering digital pictures.	1		1
	vi)	Which of the following is the first and foremost step in Image Processing? a) Image acquisition	1		1
	vii)	A biometric trait that uses an image of the physical structure of an individual's iris for identification purpose is known as- a) Iris recognition	1		1
	viii)	The CORRECT sequence of the process in a biometric recognition system is:  A. Acquisition B. Feature selection C. Feature extraction D. Identification / Verification E. Performance evaluation  Choose the correct answer from the options given below  a) A, C, B, D, E	1		1
	ix)	Contrast to physiological biometrics, which of the following is an example of a behavioural biometric? d) Signature	1		1

	x)	The keystroke biometric is: d) a behavioural biometric but not one of the six commonly used biometrics	1		1
Q.2	i.	Define the term false match rate? Distinguish between Single false match rate versus System false match rate. Definition -1 Difference -2	3		
	ii.	Describe the benefits of biometrics over traditional authentication systems.	7		
	iii.	Write note on applications of biometric security system.	7		
Q.3	i.	How to access the quality of fingerprint?	2		
	ii.	How to enhance the fingerprint? Compare with appropriate patterns. Image enhancement methods -6 Examples -2	8		
OR	iii.	What are the different features that are used in finger-scan biometric approach? Explain. Define features -2 Type of fingerprint features -5 Figure -1	8		
Q.4	i.	What is a digital image? Explain about RGB colour model. Digital image -1 RGB color model -2	3		
	ii.	What do understand by histogram of an image? Explain all the histogram-based image enhancement techniques. Histogram of image -2 Histogram based image enhancement techniques -5	7		
OR	iii.	What is image segmentation? Explain all the gradient-based edge detection methods. Image segmentation -2 Gradient-based edge detection methods -5	7		
Q.5	i.	What are the differences between ANSI and ISO data format specifications for iris record?	4		
	ii.	What do you understand by iris image quality? Explain all the quality metric presented in Pentagon plot. Iris image quality -2 Pentagon plot description -4	6		
OR	iii.	What is retinal scan biometric approach? Discuss its working functionalities. Retinal scan -2	6		

		Working	-4			
Q.6		Attempt any two:				
	i.	Write a short note on keystroke biometric.	5			
	ii.	Describe the types of Algorithms used for voice interpretation.	5			
	iii.	Why no biometric approach is 100% accurate? Derive the different factors that affect the recognition performance.	5			
		Reasons	-2			
		Explanation	-3			

\*\*\*\*\*