

# NAMIBIA UNIVERSITY

# OF SCIENCE AND TECHNOLOGY

# **FACULTY OF COMPUTING AND INFORMATICS**

# DEPARTMENT OF COMPUTER SCIENCE

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE	
QUALIFICATION CODE: 07BAC, 07BCMS	LEVEL: 7
COURSE: COMPUTER FORENSICS	COURSE CODE: CFR712S
DATE: JUNE 2024	SESSION: 1
DURATION: 3 Hours	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER				
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# THIS EXAM QUESTION PAPER CONSISTS OF 5 PAGES

(Excluding this front page)

# **INSTRUCTIONS**

- 1. Answer ALL the questions on the answer scripts.
- 2. Write clearly and neatly.
- 3. Number the answers clearly.
- 4. When answering questions you should be guided by the allocation of marks in []. Do not give too few or too many facts in your answers.

#### PERMISSIBLE MATERIALS

1. Non-programmable calculator.

- 1. Graphics files stored on a computer can't be recovered after they are delete
  - A. True
  - B. False
- 2. Areal density refers to which of the following?
  - A. Number of bits per disk
  - B. Number of bits per partition
  - C. Number of bits per square inch of a disk platter
  - D. Number of bits per platter
- 3. Hashing, filtering, and file header analysis make up which function of digital forensics tools?
  - A. Validation and verification
  - B. Acquisition
  - C. Extraction
  - D. Reconstruction
- 4. The reconstruction function is needed for which of the following purposes? (Choose three.)
  - A. Re-create a suspect drive to show what happened
  - B. Create a copy of a drive for other investigators.
  - C. Recover file headers.
  - D. Re-create a drive compromised by malware.
- 5. Hash values are used for which of the following purposes? (Choose two)
  - A. Determining file size
  - B. Filtering known good files from potentially suspicious data
  - C. Reconstructing file fragments
  - D. Validating that the original data hasn't changed
- 6. The verification function does which of the following?
  - A. Proves that a tool performs as intended
  - B. Creates segmented files
  - C. Proves that two sets of data are identical via hash values
  - D. Verifies hex editors
- 7. Which of the following is true of most drive-imaging tools? (Choose two.)
  - A. They perform the same function as a backup.
  - B. They ensure that the original drive doesn't become corrupt and damage the digital evidence.
  - C. They create a copy of the original drive.
  - D. They must be run from the command line.
- 8. A log report in forensics tools does which of the following?
  - A. Tracks file types
  - B. Monitors network intrusion attempts
  - C. Records an investigator's actions in examining a case
  - D. Lists known good files

A. Data conversion B. Transmogrification C. Transfiguring D. Demosaicing 10. Each type of graphics file has a unique header containing information that distinguishes it from other types of graphics files. A. True B. False 11. Bitmap (.bmp) files use which of the following types of compression? A. WinZip B. Lossy C. Lzip D. Lossless 12. What methods do steganography programs use to hide data in graphics files? (Choose two.) A. Insertion B. Substitution C. Masking D. Carving 13. Some clues left on a drive that might indicate steganography include which of the following? (Choose all that apply.) A. Multiple copies of a graphics file B. Graphics files with the same name but different file sizes C. Steganography programs in the suspect's All Programs list D. Graphics files with different timestamps 14. The likelihood that a brute-force attack can succeed in cracking a password depends heavily on the password length. A. True B. False 15. Which of the following is an example of a written report? A. A search warrant B. An affidavit C. Voir dire D. All of the above

16. When writing a report, what's the most important aspect of formatting?

C. Clear use of symbols and abbreviations

A. A neat appearanceB. Size of the font

D. Consistency

9. The process of converting raw images to another format is called which of the following?

which o A. B. C.	ted tools help you collect and report evidence, but you're responsible for doing f the following?  Explaining your formatting choices  Explaining the significance of the evidence  Explaining in detail how the software works  All of the above			
18. A forensic image of a VM includes all snapshots.				
	True False			
19. In order that	to be legally defensible, methods used in the recovery of data must ensure			
В. С.	The original evidence was not altered No data was added to the original No data was deleted from the original All of the above			
20. In a forensics context, hidden information about files and folders is called				
В. С.	Artifact data Metadata Archive data Read-only data			
21. You can view e-mail headers with notepad with all popular e-mail clients?				
	True False			
22. To protect original data from any alteration, you (Choose two)				
A.	Use gloves when working with the hard drive			
В. С.	Make a forensic copy of the original data  Do your forensic work as quickly as possible			
D.	Use the operating system to copy all relevant files			

# Section B (Structured Questions)

[70 marks]

# Question 1

Explain how the following are useful in computer forensics: (Please note the question does NOT say *define*)

- i. Dictionary attack
- ii. Irfan View
- iii. KFF from AccessData
- iv. Deposition bank
- v. NIST NSRL [10]

# Question 2

- a. Compare a bitmap to a vector image files. [4]
- b. What is carving? Give two technics that be used for carving. [4]
- c. Name two ways is the EXIF file format helpful when conducting a digital a forensic investigation. [2]

# Question 3

Consider investigating an Email abuse crime at government organisation. Outline the steps you would take to conduct such an investigation. [10]

# Question 4

a.	List two features that NTFS has that FAT does not.	[2]			
b.	What doe MFT stand for? What is its purpose?	[2]			
c.	You are given the following information about a Windows 10 machine.				
	Cluster size = 1024B, 8 Sectors make up a cluster				
Given that a file's size is given by extracting the last 5 numbers of you student number (e.g., if your student number is 218067546 the file size will be 67546Bytes). Given also that the file is stored in the Windows 10 machine above. Find the size of File slack as well RAM slack that is created by storing such a file (Please show all your work).					
Questi	on 5				
a. b. c. d.	State any three ways by which professional conduct can be breached by investigator.  List three necessary components of a search warrant.  List three items that should be in an evidence custody form.  Why should evidence media be write protected.	y an [3] [3] [3] [1]			
Quest	ion 6				
	Describe a scenario where you would use these types of acquisitions of digital evidence:  i. Static  ii. Sparse  Describe two concerns you should be aware of with remote acquisitions.  Give two actions you would consider to be good practice when making images of suspect's drive in a critical investigation. Justify your answers.	[4] [2] of a [4]			
Quest	ion 7				
a.	With reference to the analysis phase of digital forensics; what is scope creep?	[2]			
b.	What causes scope creep? Give two reasons.	[2]			
c.	Describe an advantage to the prosecution of scope creep.	[2]			
d. e.	works. Explain the concept of block-wise hashing.	nift [2] [2]			
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