

# **Board of Forensic Document Examiners**

## **General Knowledge Examination**

The scope of the examination is defined in the *Forensic Document Examiners Task Inventory*. The reference material parallels the nine sections in the inventory so that individuals with limited time at their disposal can prioritize their review. The references are listed in alphabetical order, not in the order of importance. The same reference may be listed in more than one section because different chapters may be relevant. The references selected are from publications, traditional reference books, and the works of selected authors that contain current research and/or information on a specific subject. It is not the Board's intention to establish any of the cited authors as authoritative; the general knowledge necessary to pass the written examination can be acquired from many other sources and from initial training and continuing education in forensic document examination.

All written questions in the examination are multiple choice. Sample questions are provided. The questions encompass subjects and information used by forensic document examiners routinely or on occasion. We recommend that if an individual does not routinely deal with any one of the listed areas, then a review of the literature is in order. Test development is a continual process. As questions are reviewed and updated to reflect current information, research and technology, additions (or deletions) will be made to this document.

There are approximately 240 question on the multiple choice portion of the test. The test taker is permitted four hours to complete the written examination. Questions are selected randomly from the test database, a specific number of questions assigned to each section. Each section is scored independently and must be passed.

The performance portion of the test consists of examining case work typical of that encountered by document examiners. Each practical examination defines the task addressed, the performance objective, a narrative, and directions or other information necessary for completing the examination. A series of questions is presented for the test taker to answer, including identifying the reasons (basis) for the proffered opinion.

Signature examinations are presented using photographs. The signatures are extracted from documents and arranged together as in a court exhibit. The test taker is provided a form on which to write his or her answers. The salient features that form the basis of the opinion must be identified. Photographs or actual documents may be used for examinations encompassing other areas listed in the Task Inventory.

All written examinations and practical examinations are proctored to insure the integrity of the test and that the test taker completes the test based on his or her own abilities. Tests are graded by Occupational Research and Assessment, Inc., an independent testing company.

# Forensic Document Examiners Task Inventory / Testing Areas

## A. DEMONSTRATING DOCUMENT EXAMINER FOUNDATION SKILLS

- 1 Demonstrate Knowledge of Handwriting Methodology
- 2 Demonstrate Knowledge of Handwriting/Hand Printing Identification
- 3 Demonstrate Knowledge of Inks
- 4 Identify Various Writing Instruments
- 5 Demonstrate Knowledge of Fonts and Type Styles
- 6 Demonstrate Knowledge of Paper
- 7 Demonstrate Knowledge of Printing Devices
- 8 Demonstrate Knowledge of Forms and Letterhead (case relevant)
- 9 Demonstrate Knowledge of Comparative Analysis Techniques
- 10 Demonstrate Professionalism

## B. GATHERING EVIDENCE

- 11 Maintain Chain of Custody (evidence handling)
- 12 Collect Standards of Comparison (handwriting/signature)
- 13 Collect Standards of Comparison (other media)
- 14 Verify Accuracy of Document Data
- 15 Analyze Document Formatting

## C. ANALYZING HANDWRITING

- 16 Examine Cursive Writing (including signatures)
- 17 Examine Hand Printing (alpha and numeric)
- 18 Recognize Influences on Handwriting Skills
- 19 Identify Letter Design Influences
- 20 Recognize Disguised Handwritten Images
- 21 Examine Graffiti
- 22 Determine Line Sequence and Direction of the Writing Movement

## D. ANALYZING FALSIFIED DOCUMENTS

- 23 Determine Document Altering Techniques
- 24 Identify Counterfeited/Fabricated Documents

## E. ANALYZING FEATURES OF PAPER AND MEDIA

- 25 Identify Watermark Characteristics
- 26 Identify Types and Characteristics of Paper
- 27 Identify Physical Characteristics of Paper
- 28 Assess Production Characteristics of Paper
- 29 Assess Physical Condition of Paper (current)

## F. ANALYZING IMPACT AND NON-IMPACT IMAGES

- 30 Analyze Copy Machine Images
- 31 Analyze Latent Images
- 32 Analyze Fax Images
- 33 Analyze Printer Images
- 34 Analyze Typewriter Images
- 35 Analyze Imaging Devices (i.e., rubber stamps, auto pens, embossing seals)
- 36 Analyze Non-Impact Pre-Print Images
- 37 Analyze Credit Card/Check Security Features

## G. USING LAB INSTRUMENTS

- 38 Use Microscope and Magnifiers
- 39 Use Videospectrum Devices (such as infrared and ultraviolet - including filters)
- 40 Use Electrostatic Detection Device
- 41 Use Photography (Polaroid, digital, and 35mm)
- 42 Use Light Sources (including various filters)
- 43 Use Digital Image Equipment
- 44 Use Photocopier
- 45 Use Measuring Devices
- 46 Other Equipment (applicable to document problems)

## H. EVALUATING EVIDENCE AND PRESENTING CASE FINDINGS

- 47 Evaluate Results of all Analyses Performed
- 48 Express Opinion/Assign Level of Certainty (e.g. know levels per ASTM standard)
- 49 Prepare Reports (verbal and written)
- 50 Prepare for Testimony (including exhibits)

## I. DEMONSTRATING KNOWLEDGE OF LEGAL PROCEDURES

- 51 Define Legal Terminology
- 52 Demonstrate Knowledge of Types of Legal Proceedings
- 53 Recognize Legal Precedents (regarding document examination issues)

## Section A — Document Examiner Foundation Skills

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### **Code of Professional Responsibility**

Board of Forensic Document Examiners

### **JOURNAL ARTICLES**

#### ***“A Sequential Multiple Approach to Determining the Relative Age of Writing Instruments”***,

Richard L. Brunelle, International Journal of Forensic Document Examiners, Vol. 1, No. 2  
April 1995

#### ***“Contemporary issues in forensic handwriting examination: a discussion of the key issues in the wake of the Starzecpyzel decision”***, Bryan Found and Doug Rogers Journal of Forensic Document Examination, Vol. 8, 1995

#### ***“Documentation of forensic handwriting comparison and identification method: A modular approach”***, Bryan Found and Doug Rogers, Journal of Forensic Document Examination, Vol. 12, 1999, Modules 3, 6, 9, 10

#### ***“Dynamics of the Writing Movement: Physical Modelling and Practical Applications”***, H. J.J. Hardy Journal of Forensic Document Examination, Vol. 5, 1992

#### ***Classification and Identification of Modern Office Copiers***, James H. Kelly (1983) The American Board of Forensic Document Examiners

#### ***“Intra-individual changes in handwriting features depending on handwriting velocity”***, Petra Halder-Sinn and Karin Funsch, Journal of Forensic Document Examination, Vol. 11, 1998

#### ***“Methodological Aspects of Handwriting Identification”***, H.J.J. Hardy Journal of Forensic Document Examination, Vol. 8, 1995

#### ***“Temporal features of handwriting: challenges for forensic analysis”***, Arnold J.W.M. Thomassen and Gerard P. Van Galen, Journal of Forensic Document Examination, Vol. 10, 1997

#### ***“Touch-ups in authentic writing”***, Darlene Hennessy Journal of Forensic Document Examination, Vol. 10, 1997

### **BOOKS:**

#### ***Detecting and Deciphering Erased Pencil Writing***, Ordway Hilton Chapters 2 and 5

#### ***Evidential Documents***, James V. P. Conway Chapter(s): Evidential Signatures; The Identification of Handwriting; Hand Printing and Numerals

#### ***Examination and Identification of Photocopies and Photocopiers***, John S. Gorajczyk 23 AM JUR POF3d 621, Lawyers Cooperative Publishing, Rochester, NY Sections 5 and 16

#### ***Forensic Examination of Ink and Paper***, Richard L. Brunelle, Robert W. Reed Chapters 1, 4, 8, 9, 12 and 13

#### ***Forensic Handwriting Identification: Fundamental concepts and principles***, Ron N. Morris Chapters 1, 5, 6, 8 and 12

#### ***Fundamentals of Document Examination***, Edna W. Robertson Chapters 10 and 14

#### ***Handwriting Identification: Facts and Fundamentals***, Roy A. Huber and A. M. Headrick Chapters 3, 6, 8 and 9

#### ***Identification of Handprinting and Numerals***, Allan R. Keown 24 AM JUR POF3d 687, Lawyers Cooperative Publishing, Rochester, NY

#### ***Questioned Documents*** (Second Edition), Albert S. Osborn Chapters VIII, IX and XIII

#### ***Questioned Documents: A Lawyer's Handbook***, Jay Levinson Chapter 3

***Scientific Examination of Questioned Documents***, Ordway Hilton  
Chapters 1, 2 and 9

***Stedman's Medical Dictionary*** (26<sup>th</sup> Edition), Williams & Wilkins (or equivalent)  
Words relating to diagnostic conditions that affect handwriting (e.g. agraphia, aphasia, dysgraphia, dyslexia)

***Suspect Documents***, William R. Harrison;  
Chapter 9

## **Section B — Gathering Evidence**

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### **JOURNAL ARTICLES**

***"The taking of handwriting samples in cases of claimed assistance in writing"***, Manfred Hecker  
Journal of Forensic Document Examination, Vol. 18&2, 1988

### **BOOKS**

***Evidential Documents***, James V. P. Conway  
Chapters: Evidential Signatures, Handwriting Investigations, Anonymous Letters

***Examination and Identification of Photocopies and Photocopiers***, John S. Gorajczyk  
23 AM JUR POF3d 621, Lawyers Cooperative Publishing, Section 21

***Examination of Questioned Documents*** (Revised Edition), Ordway Hilton  
Chapter 14

***Forensic Handwriting Identification: Fundamental concepts and principles***, Ron N. Morris  
Chapter 15

***Forensic Signature Examination***, Steven A. Slyter  
Chapter 5

***Law of Disputed and Forged Documents***, J. Newton Baker  
Chapter VI

***Questioned Documents*** (Second Edition), Albert S. Osborn  
Chapter XVII

***The Scientific Examination of Documents: Methods and Techniques***, David Ellen  
Chapter 5

## **Section C — Analyze Handwriting**

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### **JOURNAL ARTICLES**

***"Changes in a forgers handwriting pressure related to original writer's dynamics"***, Jodi C. Sita and  
Doug Rogers, Journal of Forensic Document Examination, Vol. 12, 1999

***"Documentation of forensic handwriting comparison and identification method: A modular approach"***, Bryan  
Found and Doug Rogers, Journal of Forensic Document Examination,  
Vol. 12, 1999; Modules 6 and 9

***"Dynamics of the Writing Movement: Physical Modelling and Practical Applications"***, H. J.J. Hardy  
Journal of Forensic Document Examination, Vol. 5, 1992

***"Handwriting and signatures of the visually impaired"***, Tull, Pat  
Journal of Forensic Document Examination , Vol. 5, 1992

***"Intra-individual changes in handwriting features depending on handwriting velocity"***,  
Petra Halder-Sinn and Karin Funsch, Journal of Forensic Document Examination, Vol. 11, 1998

***“Light and Electron Microscopy Approaches to Sequence of Writing Problems,***  
Joseph G. Barabe, et al, Journal of Forensic Document Examination, Vol. 9, 1996

***“Methodological Aspects of Handwriting Identification”,*** H.J.J. Hardy  
Journal of Forensic Document Examination, Vol. 8, 1995

***“Multiple Sclerosis and its effect on handwriting”,*** Patricia Girouard  
Journal of Forensic Document Examination, Vol. 13, 2000

***“Parkinson’s disease and graphic disturbances”,*** Vickie L. Willard  
Journal of Forensic Document Examination, Vol. 10, 1997

***“Temporal features of handwriting: challenges for forensic analysis”,*** Arnold J.W.M.Thomassen  
Gerard P. Van Galen, Journal of Forensic Document Examination, Vol. 10, 1997

***“The objective static analysis of spatial errors in simulation”,*** Bryan Found, Doug Rogers and  
Hermann Metz, Journal of Forensic Document Examination, Vol 12, 1999

***“Touch-ups in authentic writing”,*** Darlene Hennessy  
Journal of Forensic Document Examination, Vol. 10, 1997

***“The taking of handwriting samples in cases of claimed assistance in writing”,*** Manfred Hecker  
Journal of Forensic Document Examination, Vol. 1&2, 1988

***“The Effects of Alterations to Documents”,*** Steven A. Slyter  
29 AM JUR POF 3d 549, Lawyers Cooperative Publishing, Rochester, NY

#### **BOOKS**

***Evidential Documents,*** James V. P. Conway  
Chapter: Evidential Signatures

***Forensic Handwriting Identification: Fundamental concepts and principles,*** Ron N. Morris  
Chapter 1

***Forensic Signature Examination,*** Steven A. Slyter  
Chapters 2 and 3

***Fundamentals of Document Examination,*** Edna W. Robertson,  
Chapters 10, 14 and 15

***Handwriting Identification: Facts and Fundamentals,*** Roy A. Huber and A. M. Headrick  
Chapters 2, 3, 6, 8, and 9

***Identification of Handprinting and Numerals,*** Allan R. Keown  
24 AM JUR POF3d 667, Lawyers Cooperative Publishing, Rochester, NY

***Law of Disputed and Forged Document,*** J. Newton Baker; The Michie Company, Charlottesville, VA  
Chapter XVI

***Questioned Documents*** (Second Edition), Albert S. Osborn  
Chapter VIII and XIII

***Scientific Examination of Questioned Documents,*** Ordway Hilton.,  
Chapter 9

***Stedman’s Medical Dictionary*** (26<sup>th</sup> Edition), Williams & Wilkins (or equivalent)  
Words relating to diagnostic conditions that affect handwriting (e.g. agraphia, aphasia, dygraphia, dyslexia)

***Suspect Documents,*** William R. Harrison  
Chapters 10 and 11

***The Scientific Examination of Documents: Methods and Techniques,*** David Ellen  
Chapters 3 and 4

## Section D — Analyze Falsified Documents

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### JOURNAL ARTICLES

***“Distinguishing Between Relative Ink Age Determinations and the Accelerated Aging Techniques”***

Larry F. Stewart, et al., International Journal of Forensic Document Examiners,  
Vol. 2, No. 1, Jan/Mar 1996

***Examination and Identification of Photocopies and Photocopiers***, John S. Gorajczyk

23 AM JUR POF3d 621, Lawyers Cooperative Publishing, Rochester, NY

***“Passport Forgeries - What to look for”***, Ernie Munden, et al.

International Journal of Forensic Document Examiners, Vol. 1, No. 3, July 1995,

***“Some observations on the morphology of a ball-point pen stroke”***, P.S. Hung, et al.

International Journal of Forensic Document Examination, Vol. 1, No. 1, Jan 1995

***The Effects of Alternations to Documents***, Steven A. Slyter

AM JUR POF3d 549, Lawyers Cooperative Publishing, Rochester, NY

### BOOKS

***Detecting and Deciphering Erased Pencil Writing***, Ordway Hilton

Chapter 3

***Forensic Examination of Ink and Paper***, Richard L. Brunelle and Robert W. Reed

Chapters 1, 8 and 9

***Scientific Examination of Questioned Documents***, Ordway Hilton

Chapters 3 and 11

***Suspect Documents***, William R. Harrison

Chapter 10

***The Scientific Examination of Documents: Methods and Techniques***, David Ellen

Chapters 7 and 9

## Section E — Analyzing Features of Paper and Media

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### JOURNAL ARTICLE

***“Determining the Sequence of Folds and Writing”***, Allan R. Keown

Journal of Forensic Document Examination, Vol. 6, 1993

### BOOKS

***Forensic Examination of Ink and Paper***, Richard L. Brunelle and Robert W. Reed (

Chapters 11, 12, and 13

(Partial Compendium of Paper Industry Terms, specifically, the kinds of paper/paper finishes encountered in business documents and terms relating to watermarks)

***Fundamentals of Document Examination***, Edna W. Robertson

Chapter 20

## Section F— Analyze Impact and Non-Impact Images

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### JOURNAL ARTICLE

***“Where did this fax come from?”***, Rob Shilhanek

Journal of Forensic Document Examination, Vol. 10, 1997

### BOOKS

***Classification and Identification of Modern Office Copiers***, James H. Kelly

Chapters: Brief History, Copying Processes, Preliminary Examinations, Individual Characteristics

***Examination and Identification of Photocopies and Photocopiers***, John S. Gorajczyk  
23 AM JUR POF3d 621, Lawyers Cooperative Publishing, Rochester, NY  
Sections 1 through 4 and 16

***Manufacturing of Genuine Credit Cards***, Ron Morris

***Questioned Documents: A Lawyer's Handbook***, Jay Levinson  
Chapters 3, 4 and 7

***Rubber Stamp Examination: A Guide for Document Examiners***, Gary Herbertson  
Chapters 2, 3, 4, 5, and 7

***The Scientific Examination of Questioned Documents***, Ordway Hilton  
Chapter 11

***The Scientific Examination of Documents: Methods and Techniques***, David Ellen  
Chapter 9

## **Section G — Using Laboratory Instruments**

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### **JOURNAL ARTICLES**

***"An Electrostatic Imaging Technique for the Detection of Indented Impressions on Documents"***,  
D. J. Morantz, et al., Forensic Science International, 13, 1979

***"Applications of Experimental Variables to the use of the Electrostatic Detection Apparatus"***,  
Journal of Forensic Science, Vol. 28, 1983

***"Electrostatic Detection Apparatus (ESDA): Is it Really Non-destructive to Documents?"***  
Diane K. Tolliver, Forensic Science International, 44, 1990

***"Importance of absolute humidity in the operation of the electrostatic detection apparatus"***.  
M. L. Pearse and J.S. Brennan, Forensic Science International, 83, 1996

***"Light and Electron Microscopy Approaches to Sequence of Writing Problems"***,  
Joseph G. Barabe, et al, Journal of Forensic Document Examination, Vol. 9, 1996

***"Optimum Conditions for Examination of Documents using the Electrostatic Detection Apparatus (ESDA) Device to Visualize Indented Writing"***, Michael G. Noblett, Elizabeth L. James,  
Journal of Forensic Science, Vol. 28, No 3, 1983

***"Some parameters Affecting the Quality of ESDA Results"***, I.J. Reibeling and H.J. Kobus,  
Journal of Forensic Science (1994)

***The Effects of Alternations to Documents***, Steven A. Slyter  
American Jurisprudence POF3d 549, Lawyers Cooperative Publishing, Rochester, NY

***Thoughts for Digital Document Examination***, Richard T. McEvoy, Jr.  
Forensic Imaging, Inc., Victor, NY

### **BOOKS**

***Applied Infrared Photography***, Kodak Publication.

***Classification and Identification of Modern Office Copiers***, James H. Kelly  
Chapter: Copying Processes

***Detecting and Deciphering Erased Pencil Writing***, Ordway Hilton  
Chapters 3 and 5

***Forensic Examination of Ink and Paper***, Richard L. Brunelle and Robert W. Reed  
Chapters 2, 5, 8, 12 and 13

***Fundamentals of Document Examination***, Edna W. Robertson  
Chapter 5

***Scientific Examination of Questioned Documents***, Ordway Hilton  
Chapter 3

***The Scientific Examination of Documents: Methods and Techniques***, David Ellen  
Chapters 7 and 9

## **Section H — Evaluating Evidence and Presenting Case Findings**

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***ASTM Standard E 1658-96***, American Society for Testing and Materials

***Code of Professional Responsibility***, Board of Forensic Document Examiners

### **JOURNAL ARTICLES**

***“Contemporary issues in forensic handwriting examination: a discussion of the key issues in the wake of the Starzecpyzel decision”***, Bryan Found and Doug Rogers, Journal of Forensic Document Examination, Vol. 8, 1995

***Examination and Identification of Photocopies and Photocopiers***, John S. Gorajczyk  
23 AM JUR POF3d 621, Lawyers Cooperative Publishing, Rochester, NY

### **BOOKS**

***Forensic Signature Examination***, Steven A. Slyter (1995)  
Chapters 10 and 13

***Fundamentals of Document Examination***, Edna W. Robertson  
Chapter 20

***Questioned Documents: A Lawyer's Handbook***, Jay Levinson  
Chapter 4

***The Scientific Examination of Documents***, David Ellen  
Chapter 4

***The Scientific Examination of Questioned Documents***, Ordway Hilton  
Chapter 11

## **Section I — Demonstrating Knowledge of Legal Procedures**

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***Federal Rules of Evidence*** Opinions and Expert Testimony, Rules 701-706

***Daubert v. Merrell Dow Pharmaceuticals*** 509 US 579 (1993), 43 F.3d 1311, 113 S. Ct. 2786  
***Frye v. USA*** 64 App.D.C. 46 (1923), 293 F. 1013

***Kumho Tire Co., LTD., et al. v. Patrick Carmichael et al.*** 131 F.3d 1433, 119 S. Ct. 1167, 1169 (1999)  
***USA v. Starzecpyzel*** 880 F. Supp.2d 1027 (1995)

### **BOOKS**

***Black's Law Dictionary*** West Publishing Co., St. Paul, MN  
**Knowledge of legal terms** commonly used by legal professionals when conversing with a document examiner (e.g., collateral issue, interpleader, probative value)

***The Comprehensive Forensic Services Manual***, Steven A. Babitsky, James J. Mangraviti, Christopher J. Todd,  
Chapters 2, 3, 4, 5, 6, 13 and 15

***How to Excel During Cross-Examination***, Steven Babitsky and James J. Mangraviti, Jr. (Esquires)

**NOTE:** With permission from the publishers, the BFDE has compiled many of the journal articles into a publication for sale at a nominal price, available only to those applicants who complete the application process, to assist in their review of the literature. The test is currently in the review process. Changes to reference material will be posted accordingly.



## **SAMPLE TEST QUESTIONS FROM VARIOUS SECTIONS OF THE TEST**

- (1) **Complexity in handwriting is determined by**
- A. the number of times the pen changes directions.
  - B. the fullness of the curves.
  - C. the degree of angularity.
  - D. fluency.
  - E. the degree of variation in the slope/slant of writing.
- (2) **In examining a guided hand signature, it is important to have the writing of the guider for comparison because**
- A. if the writer is passive, the signature will contain characteristics of the guider.
  - B. if the writer is active, the signature will contain characteristics of the guider.
  - C. the guider's writing always controls the pen movement.
  - D. the writing will be more consistent with the natural speed of the guider.
  - E. there is no reason to obtain the writing of the guider.
- (3) **Which of the following steps is used in an ink comparison method to determine whether several in samples have the same formula?**
- A. Using a micro punch, samples of ink are extracted and dissolved in a solvent, then spotted on specially treated paper.
  - B. Using a razor, ink is carefully scraped from a sample and put into a sterile saline solution then spotted on specially treated paper.
  - C. Using a pipette, ink from a sample is drawn into the pipette and then put into a tray containing a silicone formula.
  - D. Micro samples of ink are lifted from the sample using a fuming method and then put into a tank containing a silicone formula.
  - E. Samples of ink are carefully smeared on a glass slide and examined under a microscope.
- (4) **Using a technique known as Thin Layer Chromatography to examine ink on several different documents requires collecting samples of the ink, and collecting samples of**
- A. the pens allegedly used in the writing.
  - B. similar inks.
  - C. the database identifiers for ink.
  - D. the paper.
  - E. no other samples are required, only ink samples.
- (5) **The \_\_\_\_\_ should always be considered a suspect when an anonymous note maligns an individual**
- A. the victim
  - B. the spouse of the victim
  - C. the ex-spouse(s) of the victim (if any)
  - D. the co-workers of the victim
  - E. the boss of the victim
- (6) **The ballpoint pen can be recognized by**
- A. the flat color of the ink and the way it absorbs into the high fibers of the paper.
  - B. the way the ink changes color as it dries.
  - C. the gloss of the ink and the way it catches the edges of the high fibers of the paper.
  - D. the lack of any indication of pressure.
  - E. the shading of the upstrokes

- (7) **Studies of the effect of writing speed by Halder-Sinn and Funsch found which of the following changes in handwriting?**
- A. Tremor increased significantly with acceleration.
  - B. Length of retraced lines increased significantly with acceleration.
  - C. Deformed (illegible) letter structures increased significantly with acceleration.
  - D. Pen lifts increased significantly with acceleration in the majority of writers.
  - E. Pen lifts decreased significantly with acceleration in the majority of writers.
- (8) **One method used to determine if two printed copies were produced on the same offset plate would be to examine**
- A. the ink for trash marks.
  - B. for photographic dirt which was not removed from the negative.
  - C. the spacing patterns and alignment.
  - D. for dissimilarities between inks used in the printing process.
  - E. the paper weight and check for dissimilar watermarks.
- (9) **A rapid technique for separating the organic components of ink is known as**
- A. treated liquid chromatography.
  - B. thin layer chromatography.
  - C. thin liquid chromatography.
  - D. treated litho chromate.
  - E. trans liquid chromatography.
- (10) **If entries were made on a document in January and the same pen was used to make entries in November, but backdated to January, which procedure would be used to determine if the back dating occurred?**
- A. Infrared spectral scanning.
  - B. Thin layer chromatography.
  - C. Raman spectroscopy.
  - D. Gas chromatography.
  - E. The correct procedure is not listed.
- (11) **Which ONE of the following is not used to match a sheet of paper to its batch source?**
- A. Rag content.
  - B. Wood pulp content.
  - C. Finish materials.
  - D. Trim marks.
  - E. Deckle edge.
- (12) **Some paper has a "wire side" which can be observed as**
- A. a pattern in the surface on one side of the paper.
  - B. a pattern of holes in the edge where the wire spiral was attached.
  - C. the presence of a thin line on one margin.
  - D. the presence of a metallic strip woven into the paper.
  - E. marks at the edge of the paper, left by the wire gripper.
- (13) **When conducting a photocopy examination to determine the origin of a photocopy, the FIRST step in the process is to determine**
- A. the generation of the copy.
  - B. the copying process.
  - C. if there was more than one copy process used.
  - D. the fusing process
  - E. the rate of enlargement or reduction of the copy.

- (14) **A document examiner can read the facsimiles received on a particular kind of machine by “reading the ribbon” used to print the fax. Which BEST describes this kind of machine?**
- A. Plain paper.
  - B. Thermal.
  - C. Thermal transfer.
  - D. Laser jet.
  - E. Cloth ribbon.
- (15) **Intaglio is also known as**
- A. letterpress.
  - B. offset lithography.
  - C. Gravure.
  - D. Collotype.
  - E. screen printing.
- (16) **Which of the following would be a better choice for determining the sequence of writing?**
- A. A stereo microscope.
  - B. A light table.
  - C. Measuring grids.
  - D. Infrared absorption or reflection.
  - E. Paper and/or ink fluorescence
- (17) **Which ONE of the following examination procedures would be performed on graphite pencil traces?**
- A. Microscopic analysis.
  - B. Spot testing.
  - C. Thin Layer Chromatography.
  - D. Chemical analysis.
  - E. Water testing.
- (18) **Exculpatory evidence is defined as**
- A. evidence not admissible in trial
  - B. evidence to clear guilt
  - C. statements of evidence made without the jury present.
  - D. a ruling by the court to consider hearsay evidence.
  - E. declarations made in chambers.
- (19) **Which of the following steps is used in an ink comparison method to determine whether several in samples have the same formula?**
- A. Using a micro punch, samples of ink are extracted and dissolved in a solvent, then spotted on specially treated paper.
  - B. Using a razor, ink is carefully scraped from a sample and put into a sterile saline solution then spotted on specially treated paper.
  - C. Using a pipette, ink from a sample is drawn into the pipette and then put into a tray containing a silicone formula.
  - D. Micro samples of ink are lifted from the sample using a fuming method and then put into a tank containing a silicone formula.
  - E. Samples of ink are carefully smeared on a glass slide and examined under a microscope.
- (20) **The best way to observe line sequence of ink and laser print is with**
- A. high intensity light at a 45-degree angle to the document
  - B. reflected bright field coaxial light
  - C. oblique (grazing) light at a very low angle
  - D. transmitted halogen light
  - E. polarized light