

Multiple Choice Questions (Enter your answers on the enclosed answer sheet)

1. Which entity maintains the largest crime laboratory in the world?
 - a. FBI
 - b. LAPD
 - c. Royal Canadian Mounted Police
 - d. ATF
 - e. Scotland Yard

2. Who established the comparison microscope as the indispensable tool of the modern firearms examiner?
 - a. Osborn
 - b. Lattes
 - c. Goddard
 - d. Galton
 - e. Gross

3. Who established the first workable crime laboratory?
 - a. Locard
 - b. Doyle
 - c. Galton
 - d. Bertillon
 - e. Osborn

4. Forensic science is the application of science to _____.
 - a. both criminal and civil laws
 - b. civil laws
 - c. crime scene reconstruction
 - d. criminal laws
 - e. speech making

5. Which specialized area of forensic science examines the relationship between human behavior and legal proceedings?
 - a. jurisprudence
 - b. forensic psychology
 - c. forensic psychiatry
 - d. behavioral criminalistics
 - e. forensic jury selection

6. Which would not be included in the work of the biology unit of a crime lab?
- a. DNA profiling
 - b. comparison of hairs
 - c. semen stains
 - d. blood typing
 - e. fingerprint analysis
7. The final evaluator of forensic evidence is the _____.
- a. prosecutor
 - b. police
 - c. accused
 - d. media
 - e. jury
8. CAD programs enhance the ability to _____.
- a. take complete notes
 - b. produce a finished crime scene sketch
 - c. create chain-of-custody documents
 - d. develop photographs
 - e. edit video tape
9. Investigators should collect possible carriers of trace evidence which may include _____.
- a. fingernail scrapings
 - b. clothing
 - c. vacuum sweepings
 - d. vehicles
 - e. All of the above.
10. The collection of standard reference samples at the crime scene is important because they _____.
- a. permit comparisons to be made with the evidence
 - b. are obtained **only** from suspects in cases of violent assault
 - c. prevent the laboratory from making mistakes
 - d. serve as a source of extra test material if required in the crime lab
 - e. prove the continuity of possession

11. _____ is a national fingerprint and criminal history system maintained by the FBI and launched in 1999.
- NIBIN
 - IAFIS
 - SICAR
 - PDQ
 - AFIS
12. Physical evidence is considered to have _____ as that of eyewitness (testimonial) evidence.
- greater value
 - less value
 - the same value
 - None of the above.
13. According to forensic entomologists, which “witness” is the first to arrive at the crime scene?
- mite
 - blow fly
 - carion beetle
 - centipede
 - spider
14. The change in refractive index upon annealing tempered glass is _____ the change in refractive index upon annealing untempered glass.
- greater than
 - less than
 - the same as
 - None of the above.
15. The _____ properties of crystals, such as refractive index and birefringence, provide points of identification that help characterize them.
- electromagnetic
 - physical
 - chemical
 - amorphous
 - optical

16. The heat intensity (hotness) of water at 100°C is _____ the heat intensity of water at 212°F.
- a. less than
 - b. greater than
 - c. the same as
 - d. None of the above.
17. The freezing point of water in Fahrenheit is _____ the freezing point of water Celsius.
- a. less than
 - b. greater than
 - c. the same as
 - d. None of the above.
18. In the case of *Daubert v. Merrell Dow Pharmaceutical, Inc.*, the U.S. Supreme Court advocated that a “gatekeeper” determine the admissibility and reliability of scientific evidence. This gatekeeper is the _____.
- a. court clerk
 - b. expert witness
 - c. trial judge
 - d. prosecutor
 - e. jury
19. Which unit has the responsibility for the examination of body fluids and organs for the presence of drugs and poisons?
- a. biology unit
 - b. physical science unit
 - c. trace evidence unit
 - d. toxicology unit
 - e. evidence collection unit
20. Who is known as the “father of forensic toxicology”?
- a. Lattes
 - b. Orfilia
 - c. Locard
 - d. Vidocq
 - e. Osborn

21. What part of a decedent's body resists rapid decomposition and is used by forensic anthropologists to provide information about the decedent?
- bones
 - hair fragments
 - teeth
 - cartilage
 - soft tissue
22. Pyrex glass _____.
- is put through an annealing process
 - is made with the addition of boron oxide
 - is laminated
 - has been tempered
 - is bullet-proof
23. Which of the following is NOT true? An expert witness must be able to demonstrate:
- education in his/her area of expertise
 - a formal degree in forensic science
 - working knowledge of the subject matter
 - significant experience in a relevant field
 - skill in trade or profession of interest to the court
24. The computerized database used to store DNA information is _____.
- CODIS
 - AFIS
 - PDQ
 - NIBIN
 - Drugfire
25. The process of a glass prism separating sunlight into component colors is called _____.
- sublimation
 - dispersion
 - reflection
 - birefringence
 - refraction

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1. A qualitative test will reveal the _____.
 - a. usefulness of the compound
 - b. purity of the substance
 - c. identity of a material
 - d. amount of the sample
 - e. density of a compound

2. Chromatography is NOT used to _____.
 - a. tentatively identify organic molecules
 - b. purify substances
 - c. separate organic molecules in a mixture
 - d. aid in analysis of illicit drug preparations
 - e. determine colors of an organic compound

3. Which chromatographic process would be LEAST likely to be utilized in the crime lab?
 - a. paper chromatography
 - b. HPLC
 - c. TLC
 - d. GC
 - e. None, all are used with equal frequency.

4. Which chromatographic process is used to analyze organic explosives and heat-sensitive drugs?
 - a. GC
 - b. paper chromatography
 - c. electrophoresis
 - d. HPLC
 - e. pyrolysis GC

5. Paint chips, plastics and fibers can be analyzed using which chromatographic process?
 - a. LC-MS
 - b. HPLC
 - c. GC
 - d. pyrolysis GC
 - e. TLC

6. TLC uses _____ as its moving phase.
- a. a gas
 - b. liquid
 - c. a carrier gas
 - d. a thin film
 - e. silica gel
7. The photons of which source have the LEAST amount of energy?
- a. infrared rays
 - b. gamma rays
 - c. radio waves
 - d. visible light waves
 - e. microwaves
8. Which absorption spectrum is equivalent to a “fingerprint” of a substance?
- a. X-ray
 - b. IR
 - c. visible
 - d. UV
 - e. No absorption spectrum is sufficiently complex as to be unique.
9. Which of the following is NOT a part of a simple spectrophotometer?
- a. sample cell
 - b. monochromator
 - c. CCD detector
 - d. radiation source
 - e. column
10. In a simple emission spectrograph, excitation of the specimen under investigation is accomplished with a(n) _____.
- a. hot plasma torch
 - b. ultraviolet light source
 - c. activated prism
 - d. inductive magnetic field
 - e. electrical arc

11. In atomic absorption chromatography, the amount of light absorbed is _____ to the concentration of the element in the test sample.
- indirectly related
 - directly related
 - parallel
 - perpendicular
 - not related
12. An element is selective in the frequency of light it will absorb. This selectivity is due to its _____.
- atomic mass
 - atomic number
 - proton cloud
 - number of neutrons
 - electron energy levels
13. Atoms having the same atomic number but different atomic masses are called _____.
- isotherms
 - isobars
 - isomers
 - isotopes
 - isometrics
14. Which type of radiation is NOT given off by radioactive decay?
- gamma rays
 - beta particles
 - X-rays
 - alpha particles
 - electromagnetic radiation
15. Which of the following is a non-destructive technique for identifying and quantifying trace elements in a test sample?
- ICP emission spectrometry
 - atomic absorption spectrometry
 - neutron activation analysis
 - microscopic examination
 - carbon arc emission spectrometry

16. What is NOT true about X-ray diffraction?
- It has outstanding sensitivity.
 - It can only be applied to solid crystalline materials.
 - It provides unique “fingerprints” for each compound.
 - It provides information as to how elements are combined in compounds.
 - It can be used in tandem with other inorganic analysis techniques.
17. In order to examine an opaque object with a compound microscope, one must _____.
- use infrared analysis
 - use reflected illumination
 - light the object from beneath the stage
 - use transmitted illumination
 - stain the object before viewing it
18. When using a compound microscope, the areas above and below the depth of focus are best viewed by adjusting the _____.
- intensity of the illumination
 - fine or coarse adjustment
 - eyepiece lens
 - numerical aperture
 - objective lens
19. Which microscope provides a right-side-up image?
- compound
 - comparison
 - stereoscopic
 - micro spectrophotometer
 - polarizing
20. The image produced by an SEM is initially displayed on _____.
- an X-ray analyzer
 - an X-ray film
 - a cathode ray tube
 - photographic paper
 - None of the above.

21. A transparent specimen is viewed through a microscope using _____ light while an opaque object requires _____ illumination.
- vertical; reflected
 - transmitted; stereoscopic
 - vertical; horizontal
 - confocal; transmitted
 - transmitted; vertical
22. Crystals that are _____ produce two planes of polarized light, each perpendicular to the other.
- colored
 - amorphous
 - solid
 - isotropic
 - birefringent
23. What is NOT true about codeine?
- It is present in opium.
 - It is not commonly seen as a street drug.
 - It is prepared synthetically from morphine.
 - It is a component in over-the-counter cough medicine.
 - It is stronger than morphine.
24. The administration of which drug eliminates an addict's desire for heroin?
- methamphetamine
 - morphine
 - OxyContin
 - methadone
 - codeine
25. The following analytical technique is considered to be a specific test in a drug identification scheme.
- thin-layer chromatography
 - color test
 - ultraviolet spectrophotometry
 - microcrystalline test
 - infrared spectrophotometry

Multiple Choice Questions (Enter your answers on the enclosed answer sheet)

1. The amount of alcohol absorbed through the stomach walls is _____ the amount of alcohol absorbed through the walls of the small intestine.
 - a. greater than
 - b. the same as
 - c. less than

2. After a blood sample is collected for alcohol testing, a(n) _____ is added to stop the blood from clotting.
 - a. antibiotic
 - b. fuel cell
 - c. preservative
 - d. anti-coagulant
 - e. monochromator

3. The rate of alcohol absorption on a full stomach is _____ the rate of absorption on an empty stomach.
 - a. greater than
 - b. the same as
 - c. less than

4. The concentration of alcohol in an exhaled breath is in direct proportion to that of the blood of the same individual. The ratio of this relationship is closest to _____.
 - a. 1:100
 - b. 1:21,000
 - c. 1:10
 - d. 1:2,000
 - e. 1:1,000

5. Alcohol is oxidized in the body primarily in the _____.
 - a. stomach
 - b. lungs
 - c. liver
 - d. kidneys
 - e. small intestine