

Write your name and date on the cover page
Do not open exam until instructed to do so

Name: _____

Date: _____

Practice Final Exam

Chem. 250

Do not open exam until told to do so.

Get out your pencil, eraser, and scientific nongraphing calculator.

Put everything else under the desk or on the floor.

Turn off or silence then stow all electronic devices.

You may leave the exam room after turning in your exam.

You may not return to the exam room after leaving (until the exam is over).

Provide the best answers as requested.

You must show work for credit.

Label your work should you use the back side of the paper.

If you have any questions during the exam, write them on the exam.

When told to do so, check that exam has all of its pages.

- 1) The Frye standard (Frye vs. US) established that:
 - a) gloves must be worn when evidence is handled by hand
 - b) the trial judge admits scientific evidence
 - c) **admissible scientific evidence must be generally accepted in the field to which it belongs**
 - d) the trial judge admits expert witnesses
 - e) the trial judge is gatekeeper

- 2) The statement, “whenever two items come into contact, there is an exchange of materials between them” is a paraphrase of which of these:
 - a) the scientific principle
 - b) the federal rules of evidence
 - c) forensic contactology
 - d) Henry’s law
 - e) **Locard’s exchange principle**

- 3) The first police officer arriving at a crime scene should do what first?
 - a) round up everyone at the scene for questioning
 - b) **secure and isolate the scene**
 - c) search for evidence
 - d) attempt to solve the crime
 - e) call the lead investigator

- 4) Which of the following is **not** a lawful exception to search without a warrant?
 - a) existence of emergency circumstances
 - b) **prior conviction for exactly the same crime**
 - c) preventing immediate loss or destruction of evidence
 - d) person and property is within immediate control of an lawfully arrested individual
 - e) all parties consent

- 5) Which case law upheld the fourth amendment right to prevent searches without a warrant **and** without consent?
 - a) **Mincey vs. Arizona**
 - b) Kumho Tire vs. Carmichael
 - c) Frye vs. US
 - d) Coppolino vs. Florida
 - e) Michigan vs. Tyler

- 6) Which of these might be able to link a suspect to a crime scene using DNA?
 - a) PDQ
 - b) IAFIS
 - c) **CODIS**
 - d) NIBIN
 - e) SICAR

- 7) The difference between evidence possessing individual characteristics from evidence possessing class characteristics is
- both classes of evidence have similar value
 - individual characteristics can be associated with a particular source with high probability, but class characteristics cannot**
 - class characteristics can be associated with a particular source with high probability, but individual characteristics cannot
 - individual characteristics can be associated with a group of possible items, but class characteristics cannot
 - class characteristics can be associated with a group of possible items, but individual characteristics cannot
- 8) Using 1 inch=2.54cm, convert 45.2cm into inches
- 452in
 - 115in
 - 17.8in**
 - 0.0452in
 - 0.115in
- 9) How is it possible to sequence the order of certain fractures in glass?
- the fracture lines of later impacts terminate at the fracture lines of earlier impacts**
 - the fracture lines of earlier impacts terminate at the fracture lines of later impacts
 - by calculating refractive index
 - by following the Becke line
 - by examining the side of the glass with the wider hole
- 10) Which type of bullet hole produces a irregular glass fracture?
- small bullet
 - fast bullet
 - large bullet
 - slow bullet**
 - more than one of the above
- 11) An analysis that tells what substances are present is called?
- quantitative analysis
 - qualitative analysis**
 - elemental analysis
 - molecular analysis
 - compound analysis
- 12) Which technique **does not** involve a separation?
- gas chromatography
 - distillation
 - electrophoresis
 - spectrophotometry**
 - liquid chromatography

- 13) Which separation technique works well for large, biological molecules like DNA?
- a) gas chromatography
 - b) pyrolysis gas chromatography
 - c) electrophoresis
 - d) mass spectrometry
 - e) liquid chromatography
- 14) The best way to tell if two inorganic substances came from the same source is to use
- a) FTIR
 - b) chromatography
 - c) bulk element analysis
 - d) finite element analysis
 - e) trace element analysis
- 15) Which technique analyzes the type and quantity of components present in samples by molar mass?
- a) mass spectrometry
 - b) neutron activation analysis
 - c) x-ray diffraction
 - d) atomic emission
 - e) atomic absorbance
- 16) Which three ridge characteristics provide the primary basis for fingerprint classification?
- a) arches, bridges, and throughfares
 - b) hoops, whorls, and loops
 - c) whorls, minutiae, and loops
 - d) loops, whorls, and arches
 - e) dots, loops, and whorls
- 17) The fingerprint system used by the FBI is known as
- a) XRF
 - b) NIBIN
 - c) CODIS
 - d) EXAFS
 - e) IAFIS
- 18) Which is a not technique that is used to develop fingerprints:
- a) ninhydrin
 - b) superglue fuming
 - c) physical developer
 - d) DFO
 - e) electrostatic powder

- 19) The organ from which hair grows that also contains DNA is the:
- a) cuticle
 - b) cortex
 - c) follicle
 - d) medulla
 - e) root
- 20) Which phase of hair growth provides the richest source of DNA:
- a) telogen phase
 - b) follicle phase
 - c) catagen phase
 - d) crystalline phase
 - e) anagen phase
- 21) Approximately how many hairs should be collected from the scalp:
- a) 2
 - b) 5
 - c) 50
 - d) 100
 - e) 500
- 22) Which equipment is designed examine a standard and a reference fiber at the same time:
- a) compound microscope
 - b) microspectrophotometer
 - c) comparison microscope
 - d) IR microscopy
 - e) polarization microscopy
- 23) Which equipment provides color information about color composition of a fiber:
- a) compound microscope
 - b) microspectrophotometer
 - c) comparison microscope
 - d) IR microscopy
 - e) polarization microscopy
- 24) Which technique is used to examine the layer structure of paint?
- a) compound microscope
 - b) IR spectroscopy
 - c) x-ray diffraction
 - d) pyrolysis GC
 - e) XRF

- 25) More than 75% of evidence evaluated at crime laboratories is
- a) handled improperly
 - b) drug related
 - c) missing reference samples
 - d) not from a crime scene
 - e) weapons and ammunition
- 26) Drug use can lead to dependence in these areas
- a) none of the other answers
 - b) sociological and physiological
 - c) psychological and physiological
 - d) sociological and psychological
 - e) sociological, physiological, and psychological
- 27) Narcotic drugs have the following physiological effect(s)
- a) lower the rate of physiological activity
 - b) raise the rate of physiological activity
 - c) increase perceived physical experiences
 - d) reduce pain and/or induce sleep
 - e) increase pain and/or induce sleep
- 28) Marijuana is which class of drug?
- a) narcotic
 - b) stimulant
 - c) depressant
 - d) hallucinogen
 - e) sycophant
- 29) Heroin is which class of drug?
- a) narcotic
 - b) stimulant
 - c) depressant
 - d) hallucinogen
 - e) sycophant
- 30) Alcohol belongs to which class of drug?
- a) narcotic
 - b) stimulant
 - c) depressant
 - d) hallucinogen
 - e) sycophant

- 31) Which legislation established 5 schedules for drugs including criminal penalties for individual drug trafficking?
- a) **Controlled Substances Act**
 - b) Drug Enforcement Act
 - c) Contraband Information Act
 - d) Henry's Law
 - e) Federal Rules of Evidence
- 31) Which test turns purple in the presence of heroin, morphine, and opium derivatives, as well as orange brown in the presence of amphetamines and methamphetamines?
- a) Scott Test
 - b) Duquenois-Levine
 - c) **Marquis**
 - d) Dillie-Koppanyi
 - e) Van Urk
- 32) The way to reduce the maximum blood alcohol level for a given dose of alcohol is?
- a) exercising
 - b) sleeping
 - c) **eating**
 - d) thinking
 - e) hyperventilating
- 33) Alcohol is primarily removed from the body by?
- a) breathing
 - b) the kidneys
 - c) **the liver**
 - d) the brain
 - e) the small intestine
- 34) The path of blood going to oxygenate body tissues is?
- a) **left ventricle, arteries, capillaries, tissues, capillaries, veins, right atrium**
 - b) right atrium, veins, capillaries, tissues, capillaries, arteries, left ventricle
 - c) right ventricle, veins, capillaries, alveoli, capillaries, arteries, left atrium
 - d) left atrium, arteries, capillaries, alveoli right, capillaries, veins, right ventricle
 - e) atrium, tissue, capillaries, capillaries, ventricle
- 35) The scientific principle that allows blood alcohol concentration to be related to breath alcohol concentration is?
- a) Federal Rules of Evidence
 - b) **Henry's Law**
 - c) Controlled Substances Act
 - d) Drug Enforcement Act
 - e) Body Alcohol to Free Exhales

- 36) Which of the following would **not** normally be considered a field sobriety test?
- a) portable alcohol breath monitor
 - b) horizontal gaze nystagmus test
 - c) **blood test**
 - d) walk and turn
 - e) one leg stand
- 37) For blood to be admitted as evidence for blood alcohol content, it must be?
- a) drawn at the crime scene
 - b) drawn within 30 minutes of the crime scene
 - c) accompanied by field sobriety tests
 - d) **drawn under medically acceptable conditions by a qualified individual**
 - e) taken more than once in quantities of 100mL
- 38) The level of blood alcohol that is deemed by all states to be intoxicated while driving is?
- a) 0.01mg alcohol per 100ml of blood
 - b) 0.02mg alcohol per 100ml of blood
 - c) 0.04mg alcohol per 100ml of blood
 - d) **0.08mg alcohol per 100ml of blood**
 - e) 0.10mg alcohol per 100ml of blood
- 39) Which drugs are basic with a pH greater than 7
- a) methadone and amphetamines
 - b) amphetamines and aspirin
 - c) barbiturates and aspirin
 - d) barbiturates and amphetamines
 - e) barbiturates and methadone
- 40) A drug recognition expert
- a) initiates the chain(s) of custody for drug-related crimes
 - b) holds the key(s) to the chain(s) of custody for drug-related crimes
 - c) leads the crime scene investigation team for drug-related crimes
 - d) knows the applicable state and federal laws for drug-related crimes
 - e) **is an officer trained to recognize the effects of drugs**
- 41) Fire and explosion crime scenes are difficult to investigate because
- a) of the heat, fire, and water
 - b) of the destruction
 - c) there are no suspects at the crime scene
 - d) the evidence is likely to possess class characteristics
 - e) **all of the above**

- 42) The concentration limits of fuel that is capable of burning is called the
- a) ignition temperature
 - b) pyrolysis
 - c) exothermic
 - d) ignition temperature
 - e) flammable range
- 43) The burning of fuel without a flame is called
- a) ignition temperature
 - b) pyrolysis
 - c) glowing combustion
 - d) ignition temperature
 - e) flammable range
- 44) Soot, ash, and other similar evidence from an arson scene should be packaged in
- a) plastic bags
 - b) paper bags
 - c) paint cans
 - d) plastic bottles
 - e) glass bottles
- 45) The most widely used analytical approach to evaluate arson evidence is?
- a) x-ray fluorescence
 - b) UV-VIS spectroscopy
 - c) neutron activation analysis
 - d) gas chromatography
 - e) infrared spectroscopy
- 46) Explosives with a velocity of detonation less than 1000m/s are known in forensic science as _____ explosives
- a) military
 - b) commercial
 - c) low
 - d) lesser
 - e) safe
- 47) The most common commercial explosive in the US is
- a) TNT
 - b) ammonium nitrate
 - c) RDX
 - d) PETN
 - e) PCP

- 48) The blood types are
- a) **A, B, AB, O**
 - b) OA, OB, AB, O
 - c) AO, BO, AB, O
 - d) OA, OB, AB, OO
 - e) AO, BO, AB, OO
- 49) Type AB blood contains which of the following antibodies
- a) anti A
 - b) anti B
 - c) anti A and anti B
 - d) **neither anti A nor anti B**
 - e) anti M
- 50) Type O blood expresses which of the following antigens
- a) A
 - b) B
 - c) A and B
 - d) **neither A nor B**
 - e) M
- 51) What test can be used to determine what species blood is from
- a) luminol test
 - b) **precipitin test**
 - c) Griess test
 - d) litmus test
 - e) Scott test
- 52) Semen stains can be identified with which test?
- a) luminol test
 - b) precipitin test
 - c) litmus test
 - d) Scott test
 - e) **acid phosphatase test**
- 53) Clothing evidence that contains stains should be stored in which packaging?
- a) druggist's fold
 - b) paint cans
 - c) plastic bags
 - d) **paper bags**
 - e) plastic bottles

- 54) DNA replicates using which enzyme?
- a) DNA-ase
 - b) proteinase
 - c) **polymerase**
 - d) amylase
 - e) cellulase
- 55) The technique that allows small strands of DNA to be amplified for detection is known as
- a) PCP
 - b) **PCR**
 - c) CODIS
 - d) DNA-ase
 - e) DAD
- 56) Which analytical technique is used to analyze DNA patterns?
- a) mass spectrometry
 - b) **electrophoresis**
 - c) infrared spectroscopy
 - d) liquid chromatography
 - e) fluorescence spectroscopy
- 57) What device is recommended to remove dried biological material when it is not possible to submit the original article?
- a) scraper
 - b) forceps
 - c) tape
 - d) glue
 - e) **cotton swab**
- 58) Biological evidence should be cooled or refrigerated except for which of the following (that should be stored in glass or plastic and then frozen)?
- a) blood on clothing
 - b) semen on clothing
 - c) both blood and semen on clothing
 - d) **blood on soil**
 - e) semen on soil
- 59) The markings that bullets receive when passing through a rifle barrel are called
- a) grooves
 - b) lands
 - c) rifles
 - d) **striations**
 - e) breechblocks

- 60) Which technique or tool is used to determine if striation patterns match on two bullets
- a) **comparison microscope**
 - b) compound microscope
 - c) stereomicroscope
 - d) microspectrophotometer
 - e) polarization microscope
- 61) The national database that tracks firearm evidence is known as
- a) IAFIS
 - b) ALVIN
 - c) CODIS
 - d) **NIBIN**
 - e) NRA
- 62) Which test is used to develop gunpowder residues?
- a) Marquis test
 - b) precipitin test
 - c) acid phosphatase test
 - d) PSA test
 - e) **Griess test**
- 63) How should dusty shoeprint evidence be captured and stored?
- a) plaster of Paris
 - b) **electrostatic kit**
 - c) superglue fuming
 - d) iodine fuming
 - e) physical developer
- 64) How should tool mark evidence be captured and stored?
- a) plaster of Paris
 - b) electrostatic kit
 - c) superglue fuming
 - d) **silicone putty**
 - e) physical developer

