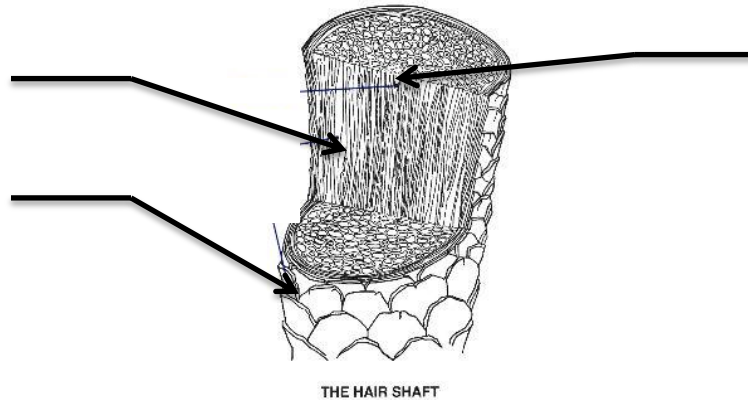


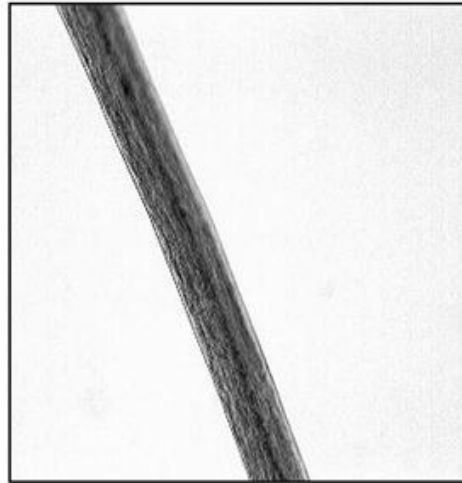
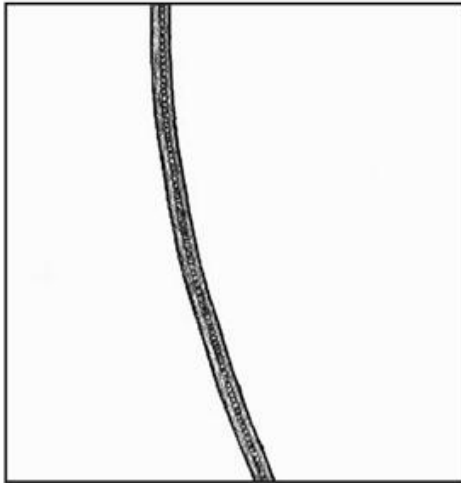
2013 Forensics Test

Clio Invitational

- 1) Label the correct parts of a hair shaft below using three of the following terms:
- Medulla
  - Cuticle
  - Follicle
  - Cortex
  - Dermal papilla



- 2) The roots of a hair sample are very distinguishing between humans and animals. Label each of the following pictures of hair roots as either human or animal. Each choice will be used once.



- 3) You have three fibers and perform burn tests on all three. The results are seen below.

Fiber A

Not Self-Extinguishing  
Burns and chars  
Odor of burning paper  
Creates a soft, gray ash

Fiber B

Self-Extinguishing  
Burns briefly and melts  
Odor of celery  
Creates a hard gray bead

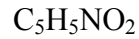
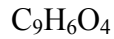
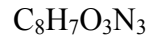
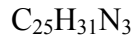
Fiber C

Not self-extinguishing  
Burns and chars  
Odor of burning grass  
Creates a soft, gray ash

Label each fiber using options from the following list (only three fibers will be used, non will be doubled up).

Cotton, wool, silk, linen, nylon, spandex, polyester

- 4) Luminol is a chemical used by crime scene investigators to identify blood stains. What is the chemical formula for luminol? (circle the correct answer)



- 5) In order to obtain a strong glow so that the blood stains are easily seen, luminol requires a catalyst to accelerate the chemical reaction that occurs between luminol and hydrogen peroxide. What is the catalyst in this case? (circle the correct answer)

Iron in hemoglobin

Cryoprecipitated Antihemophilic Factor (AHF) in plasma

Antibodies attached to RBC's

Fibrinogens in blood plasma

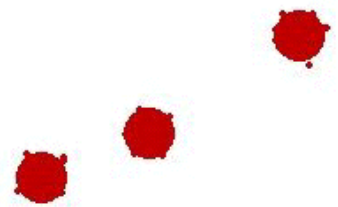
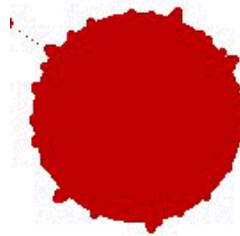
- 6) What is the most common blood type? \_\_\_\_\_

- 7) What is the least common blood type? \_\_\_\_\_

- 8) Complete the following chart by entering 'yes' or 'no' in each box.

<b>ABO Blood Type</b>	<b>Antigen A</b>	<b>Antigen B</b>	<b>Antibody Anti-A</b>	<b>Antibody Anti-B</b>
<b>A</b>				
<b>B</b>				
<b>O</b>				
<b>AB</b>				

- 9) Given the pictures below, identify which blood spatters would be formed at low, medium and high velocity. Each choice will be used once.





10) What type of fingerprint is seen above? \_\_\_\_\_

Match the points on the fingerprint with the name of the characteristic below:

11) \_\_\_\_\_ Delta

15) \_\_\_\_\_ Crossover

12) \_\_\_\_\_ Pore

16) \_\_\_\_\_ Core

13) \_\_\_\_\_ Ridge ending

17) \_\_\_\_\_ Island

14) \_\_\_\_\_ Bifurcation

Answer each of the following as 'true' or 'false'.

18) \_\_\_\_\_ There is no established link between the fingerprint patterns of a child and that of their parents.

19) \_\_\_\_\_ There is no known method of determining the age of a latent print.

20) \_\_\_\_\_ A ridge that is thinner and shallower than those surrounding it may be termed 'incipient'.

21) \_\_\_\_\_ The fingerprinting acronym ACE-V stands for "analyze, collect, evaluate, and verify."

22) Which of the following is not a method for collecting latent prints? (circle the answer)

Fluorescent powders

Cyanoacrylate

Leuco Crystal Violet

Ninhydrin

Answer each of the following as 'true' or 'false'.

23) \_\_\_\_\_ The difference between HDPE and LDPE is in the amount of crosslinking between the polymer chains.

24) \_\_\_\_\_ PETE is a condensation polymer.

25) From the following list of polymers, circle those that are thermoplastics:

PETE

PS

PC

PMMA

PVC

PP

LDPE

HDPE

26) Draw the repeating unit of polypropylene.

27) If a body is found and only blowfly eggs (no larva or pupa) are present, what is the maximum amount of time that has passed since the victim was killed? (circle the best answer and assume that adult blowflies found the body immediately.)

2 hrs

24 hrs

3 days

10 days

14 days

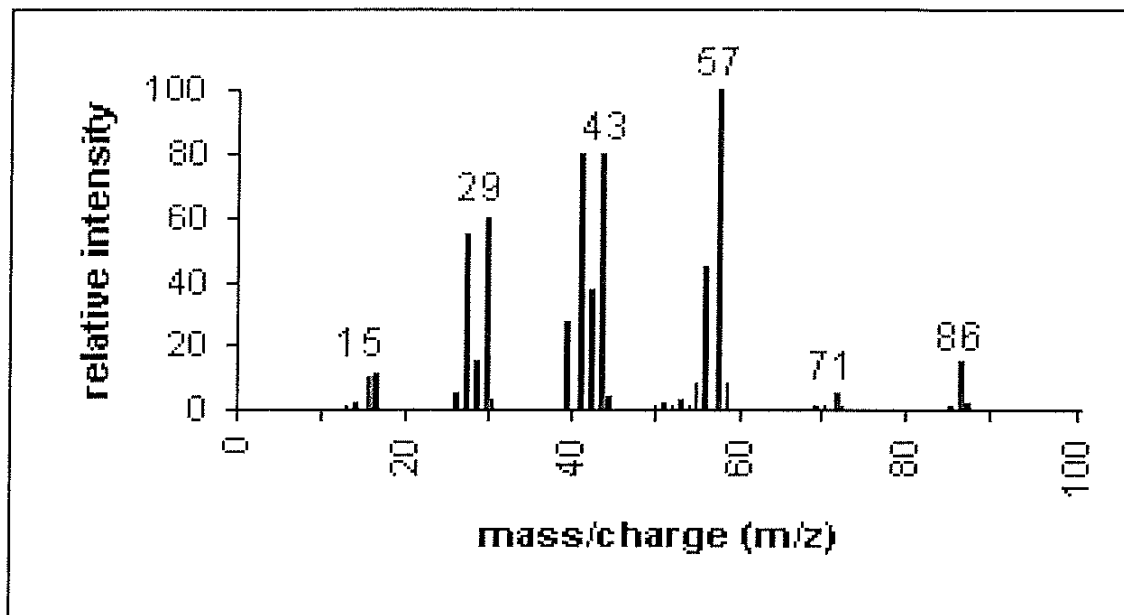
28) Put the following in order of appearance should a corpse sit undiscovered long enough.

a. Beetles

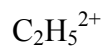
b. Blow Fly

c. Moth Larvae

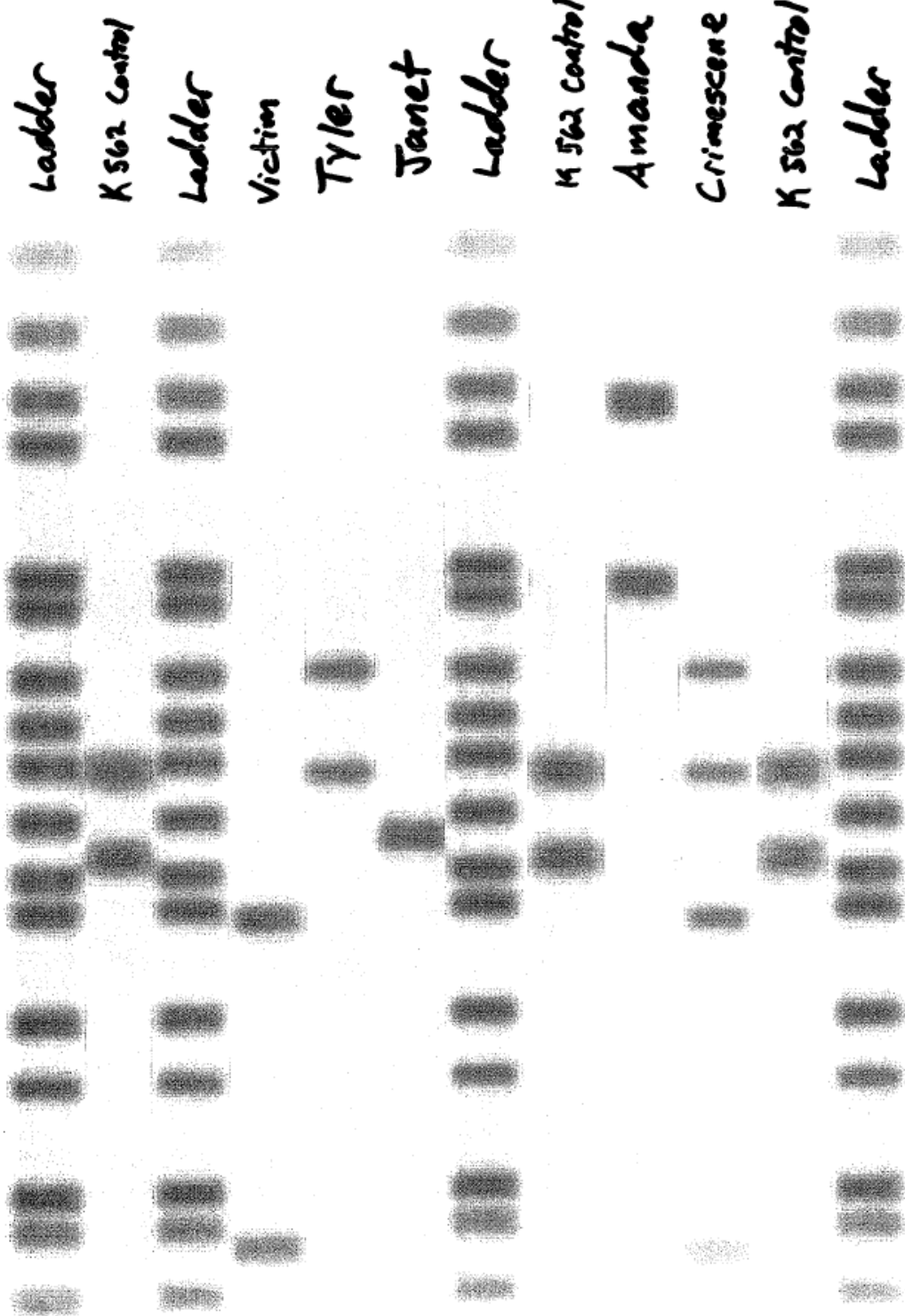
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_



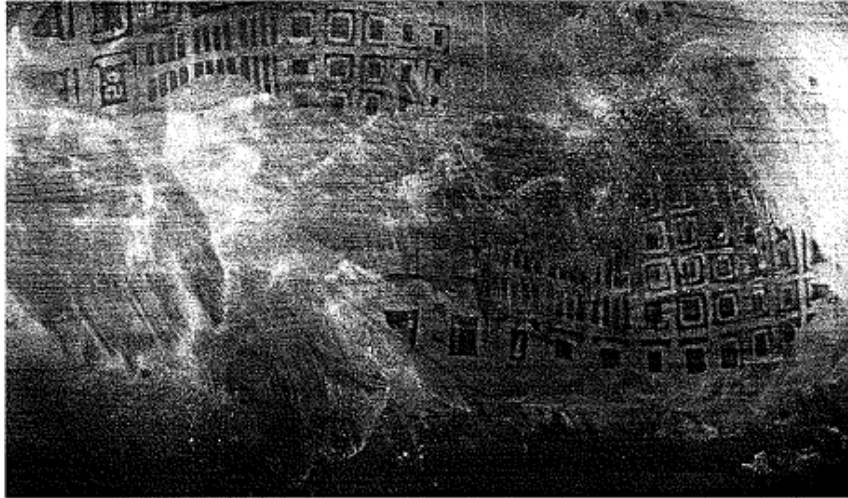
- 29) What is the most likely molar mass of this chemical compound? \_\_\_\_\_
- 30) What is the m/z value of the base peak? \_\_\_\_\_
- 31) The pattern shown by the peaks identify specific parts of the compound. What is the probable molecular formula for this compound? \_\_\_\_\_
- 32) If the mobile phase in a chromatography experiment moved 15 cm and  $R_f$  value of one of the compounds in the mixture was 0.85, how far would the compound move on the paper?
- 33) In paper chromatography, what is the stationary phase (be specific)?
- 34) Which particle would show the greatest deflection in a mass spectrometer? (circle the correct answer)



35) DNA evidence was collected from a crime scene as well as from the victim. DNA evidence was also collected from Tyler, Janet and Amanda. Analyze the evidence below and determine if any of the suspects are the guilty party.



36) A set of shoe prints was found at the scene of a crime and photographed. The soles of the shoes of four suspects were also photographed for comparison. IF one of the shoes matches, circle the name of the appropriate suspect above the photograph. If none of the shoes match, write "No Match" on the page.

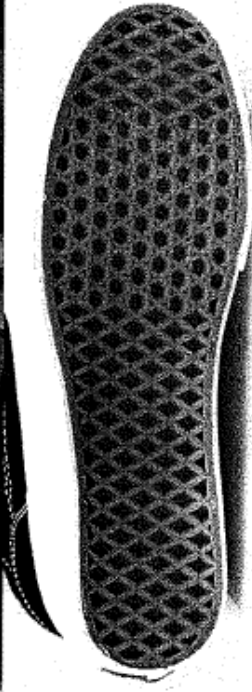


Steve

Amanda

Janet

Murphy





37) Which of the following is used to detect glucose in a solution? (circle the correct answer)

Hydrochloric acid

Sodium hydroxide

Benedicts solution

Iodine

Match the color of the burning chemical with the chemical that most likely produced it:

38) \_\_\_\_\_ Sodium

a) faint green flame

39) \_\_\_\_\_ Lithium

b) yellow flame

40) \_\_\_\_\_ Potassium

c) light purple flame

41) \_\_\_\_\_ Boric Acid

d) red flame

42) \_\_\_\_\_ Calcium

e) bright green flame

43) \_\_\_\_\_ Ammonium Chloride

f) yellow-red flame