Forensic Science Final Study Guide

Topics to be studied:

- Lab safety
- CSI effect
- CSI web adventure
- Crime scene sketching
- Class vs individual evidence
- Probability and school evidence
- Observations and inferences
- Locard's Exchange Principle
- How to take fingerprints
- Fingerprint ridge characteristics
- Fingerprint patterns
- Dusting for prints
- Parts of a hair

- Using a microscope
- Making a wet mount
- Human hairs vs animal hairs
- Knitted and woven patterns
- Warp and weft
- Individual fibers
- Reactions with chemicals
- Fabric dyes
- Blood typing
- Blood splatter
- LD50 meaning and calculations
- Reactions with over-the-counter medications

Practice questions:

1. What should you do in the forensics lab if you break a glass beaker full of chemicals? Describe the steps.
2. What kind of behaviors are unacceptable in the lab?
3. How do CSI-type shows affect actual criminal cases?
4. Define forensic science, toxicology, ballistics.
5. Differentiate between class evidence and individual evidence.
6. Give three examples each of class evidence and individual evidence. Explain why each is classified as such.
7. Define observations and inferences.
8. Give two examples each of observations and inferences.
9. In your class of 30 students, 7 are wearing jeans. What percentage of students in your class are wearing jeans? If you apply this percentage to the entire student body of 2214 students, how many of your peers might be wearing jeans?
10. Video surveillance shows the suspect in a crime wearing jeans. Is this "good" evidence?
11. What is Locard's exchange principle?
12. How do you see Locard's exchange principle in your own life? Give specifics.

14. In the fingerprint below, identify at least eight different ridge characteristics.

fork
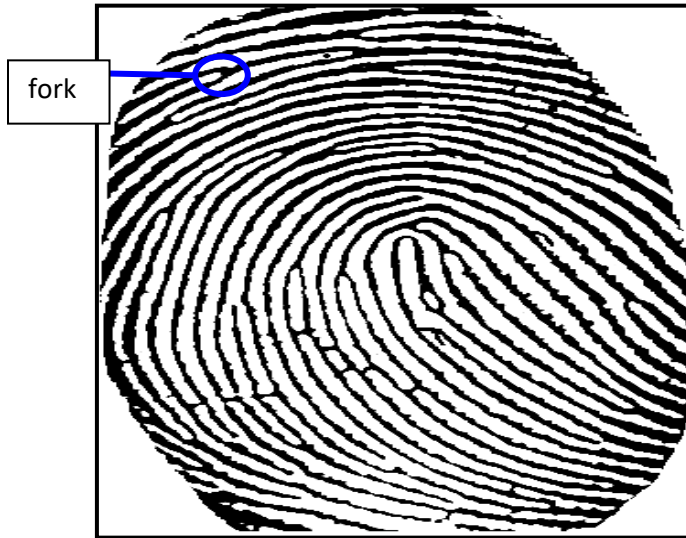
15. Identify each fingerprint pattern below using the classification groups listed:

Plain arch   Plain whorl
Tented arch   Central pocket loop
Radial loop (right thumb)   Double loop
Ulnar loop (right thumb)

1.   2.   3.

4.   5.   6.

7.   8.   9.
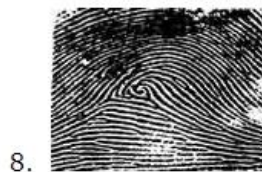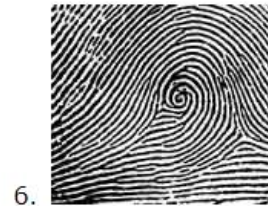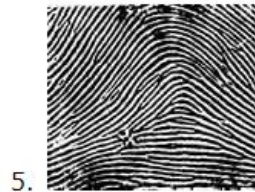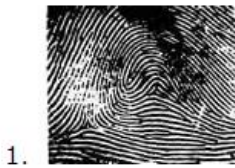
16. Describe how you would dust for fingerprints.
17. Draw a picture of a strand of hair as seen under a microscope. Label the different parts of the hair.
18. How are human hair and animal hair similar? Different?

19. What information can be determined from looking at a hair under the microscope? What cannot be determined?
20. How is hair individual evidence? Explain.
21. How is hair class evidence? Explain.
22. Draw an example of a woven fabric. Identify the warp and weft.
23. Draw an example of a knitted fabric.
24. What are natural fibers? Give at least three examples.
25. What are synthetic fibers? Give at least three examples.
26. In the fiber lab, what were some common properties of natural fibers? Synthetic fibers?
27. How did specific fibers react to the chemicals in the fiber lab? How did they react to the dyes?
28. How are a dissecting microscope and compound microscope different? Give several microscope tasks and identify which microscope is better suited for each task.
29. A white cotton fiber was found on the red sweatshirt of a victim. A white cotton fiber was taken from a suspect's shirt. After testing 310 white shirts, the lab found the fiber matched 13 of them. What is the probability that the crime scene fiber and that of the suspect matched simply by chance?
30. What does a high probability in the question above indicate? What does a low probability indicate?
31. In an investigation, is a high or low probability more useful? Explain.
32. List the eight different blood types.
33. Describe how you would experimentally determine the blood type of a suspect.
34. What does "agglutination" mean?
35. If a suspect has type B+ blood,
    a. What ABO antigens are present on the red blood cells?
    b. What ABO antibodies are found in the blood?
    c. If the suspect needed a blood transfusion, what types could they receive?
    d. What blood types could safely receive this suspect's blood?
36. How is blood individual evidence? Explain.
37. How is blood class evidence? Explain.
38. In the blood splatter lab you performed three different experiments. Briefly describe how the blood splatters changed based on your variables.
39. What does LD_{50} mean for a substance?
40. Use your mass in lbs to calculate your mass in kg. Show all work including units.
41. The LD_{50} in mice for ethanol is 8100 mg/kg of body mass. Using this information, calculate the grams of ethanol it would take to maybe kill you. Show all work including units.
42. You find an unlabeled bottle of other-the-counter painkillers. As a stellar forensic science student, describe how you would determine what painkiller it is.