BIOL 104 Forensic Biology

Exam II Review

**Chapter 1 Fingerprints**

1. What contributions did Henry Faulds, Francis Galton, Juan Vucetich and Edward Richard Henry each make to fingerprinting?
2. Why are fingerprints considered individual evidence and what is the foundation for their acceptance in court?
3. What are fingerprints?
4. How does thin skin differ from thick, or friction, skin? How does epidermis differ from dermis?
5. Be able to identify ridge characteristics, or minutiae, on a sample fingerprint.
6. Be able to identify the general ridge patterns that allow fingerprints to be systematically classified: radial loop, ulnar loop, plain whorl, central pocket loop, double loop, accidental, plain arch, and tented arch.
7. Be able to calculate an individual’s primary classification system when given the point values and equation.
8. What are latent prints?
9. What three glands provide the secretions for latent prints and how do they differ?
10. Know some techniques for developing latent prints including powders, iodine, ninhydrin, silver nitrate, and cyanoacrylate.
11. What is sublimation?
12. What are types of prints can be analyzed?
13. What is AFIS? How was it improved by IAFIS?
14. What are biometrics and how can they be used?

**Lab 5 Fingerprinting**

1. What are latent prints? What are inked prints?
2. Why did running one of your thumbs or fingers down the side of your nose or through your hair help you make a latent print?
3. How were latent prints developed with powder and lifted?
4. What are the components of a fingerprint?
5. How are ninhydrin, iodine, and super glue used to detect latent fingerprints?

**Chapter 7 The Microscope**

1. What are the differences between a simple microscope, a compound microscope, and a stereoscope or dissecting microscope?
2. Know the functions and be able to label the following parts of a compound light microscope: eyepiece, ocular lens, body tube, nosepiece, objectives, arm, stage, stage clip, mechanical stage adjuster, course adjustment/focus knob, fine adjustment/focus knob, diaphragm, illuminator, and base.
3. Be able to calculate the total magnification when given the magnification of the ocular lens and an objective lens.
4. What is the field of view and how does it change as magnification increases?
5. Be able to calculate the diameter of a field of view under a new objective when given the magnification and diameter of a field of view under another objective.
6. What is a comparison microscope?
7. What are electron microscopes?

**Chapter 13 Hairs, Fibers and Paint**

1. What is a hair follicle?
2. What are the three layers of a hair and where are they located?
3. What scale patterns are found in the cuticles of humans and animals?
4. In which part of the hair are pigment granules embedded?
5. What patterns can be found in the medulla?
6. How do the medullary indexes differ between humans and animals?
7. What are the three phases of hair growth and how do they differ?
8. What part of the hair is best for DNA analysis?
9. How does nuclear DNA differ from mitochondrial DNA?
10. How many hairs are needed for a representative sample of head hair? Of pubic hair?
11. What is the difference between natural fibers and manufactured fibers? Be able to recognize examples of each.
12. What is a monomer? What is a polymer?
13. When can fiber evidence be individual evidence?
14. How can class characteristics obtained from fibers aid in an investigation like the Wayne Williams’ case?
15. How should fiber evidence be collected and preserved?

**Lab 6 Examination of Hair and Textile Fibers by Microscopy**

1. Be able to label the medulla, cortex and cuticle as in Figure 15-1.
2. Be able to identify the scale patterns as in Figure 15-2.
3. How do human hairs differ from animal hairs?
4. What is the difference between a longitudinal section and a cross section?

**Chapter 10 Forensic Serology**

1. How many different blood factors have been identified? Which are the most important?
2. Why is blood important in forensic analysis?
3. What are the components of blood?
4. What are the different types of formed elements found in blood? How do white blood cells differ from red blood cells?
5. What are antigens and antibodies?
6. Be able to determine the type of blood based on agglutination.
7. What is the Rh factor and how does it influence blood type?
8. What is a gene? What is a chromosome?
9. Know the terms karyotype, autosome, and sex chromosomes.
10. Which sex chromosomes are found in normal females? Normal males?
11. What are the female and male gametes? What is a zygote?
12. What is a locus? What is an allele?
13. What do the terms homozygous and heterozygous mean?
14. What do the terms dominant and recessive mean?
15. What do the terms genotype and phenotype mean?
16. How does the Kastle-Meyer Color Test indicate the presence of blood? What are false positives?
17. What is Luminol? What are the advantages and disadvantages of using Luminol?
18. How do precipitin and gel diffusion tests indicate whether blood is from a human or a specific type of animal?
19. Can the human immune system naturally detect the presence of drugs or other chemicals?
20. What is the difference between polyclonal and monoclonal antibodies? How are each produced?
21. What is EMIT and how is it used to detect marijuana metabolites in blood?
22. What is acid phosphatase and why is it used to detect semen?
23. What is oligospermia? What is aspermia?
24. What evidence is collected from a victim as part of a rape kit?
25. How does Locard’s exchange principle influence rape evidence?

**Chapter 12 Crime-Scene Reconstruction: Bloodstain Pattern Analysis**

1. How does surface texture influence bloodstains? What is satellite spatter?
2. How is the direction of travel determined from a bloodstain?
3. How does the angle of impact influence bloodstains?
4. How are the areas of convergence and origin determined from bloodstains?
5. How do bloodstains resulting from arterial gush or spurt often appear?
6. How do cast-off stains often appear and what can they reveal about a crime?
7. What is impact spatter?
8. What is the difference between forward and back spatter?
9. How do low-velocity, medium-velocity and high-velocity impact spatter differ?
10. What is a transfer bloodstain and what can it reveal about a crime?

**Lab 7/8 Blood**

1. What is the difference between a presumptive test and a confirmatory test?
2. Be able to interpret the results of a Kastle-Meyer Test.
3. Be able to interpret the results of a blood typing test.
4. How does Luminol detect the presence of blood?
5. How is the impact angle of blood calculated?