PLANT HORMONES CONTINUED
What factors are involved in abscission? What are the hormones involved in dormancy, germination, flowering? What are the functions of ethylene, gibberellins, abscisic acid? How is phytochrome involved in photoperiodism? What is the basis for apical dominance?

Plant transport.
What factors may be involved in moving water up the xylem? What could speed it up? What would be the effect of closing the stomata? How are nutrients moved from leaves to other plant parts? What controls the gas flow into and out of leaves?

Circulatory System.
How is the circulatory system important to maintenance of homeostasis? What is the difference between arteries and veins and capillaries? What kinds of factors can influence blood pressure? How is the heart different in fish (gill breathers) and mammals (air breathers)? How is the nervous system involved with circulation? What is the fight and flight reaction of the sympathetic nervous system, in terms of heart and arteries? Do all arteries respond in the same way? Name an adaptation in the embryonic heart which allows it to develop so that it can work for lung breathing immediately after birth, but use the placenta for its gas exchange during development?

Immune System
What is the clonal selection theory? What does that imply about the DNA present in the genes for light and heavy chains of antibodies in the cells with all the different types of antibody receptors on their surfaces? What is the difference between a B and T cell and their response to foreign antigen? Why is the thymus important to the immune system? What does inflammation have to do with the immune system? What is different about the light and heavy chain genes compared to most genes?

BIOL 150 REVIEW QUESTIONS FOR FIRST TEST.

NUCLEIC ACIDS AND GENES

What are some differences between RNA and DNA?
What is the difference between mRNA, tRNA, rRNA, rRNA?
What is the difference in numbers of genes coding for each?
What is the difference between DNA and cDNA?
What is a polyribosome? What kinds of molecules would you likely find associated together in them?
What is a codon, an anticodon, and how do these determine amino acid sequence?
What are exons and introns and what will happen to them?
What do we mean when we say DNA replication is conservative?
What was wrong with the one gene-one enzyme hypothesis?
Why is DNA replication continuous in one strand but not in the other?
SUPPLEMENTARY REVIEW SHEET FOR FINAL

NERVOUS SYSTEM
What is the difference between a narcotic and a stimulant in terms of where or how they have an effect?
How are nerve impulses terminated?
What part of the brain is associated most with autonomic controls having to do with thirst, hunger, sexual urges? What is the relationship with the pituitary?
What part of the brain has to do with autonomic control of breathing, heart rate, blood pressure? How does this control occur, and what triggers it?
What is the function of the cerebellum, and where are all the impulses coming from that enter it?
What is the difference between a receptor ion channel and a voltage regulated ion channel?

SENSATION
What is the layer of the eye with the sensory cells, and what is the relationship with the optic nerve?
What kinds of cells can detect light and what is the mechanism?
Where is the visual cortex? What is the arrangement of connections with the two retinas?
What is wrong with the vision in far-sighted and nearsighted eyes?
How is sound transmitted to the inner ear? Is sound transmitted to the brain? How does the brain know the difference between electrical impulses coming in from different sense organs?
What kinds of receptors of stimuli are in the inner ear? How are they different from the chemical receptors?

HORMONES
How can enzymes be regulated from outside the cell?
What is a second messenger, and give three examples which we have discussed.
How are hormone actions terminated?
What is the difference between receptors and transfer of information with steroid and peptide hormones?
What is the effect of IP3 release?

MUSCLE
What is the difference between striated and smooth muscle?
What is calmodulin and what is its relationship to troponinC?
What is the necessary ion release prior to contraction, and what causes it?
What causes contraction after its release?
What are the components of the sarcomere and which of them shorten during the contraction? What is the sliding filament model? What is the essential molecule for changing the shape of the myosin head?
What is different between cardiac and voluntary striated muscle?

KIDNEY
Catalog all of the functions of the kidney nephron regions as to whether they are due to diffusion, osmosis, filtration, active reabsorption, active secretion, hormone controlled channel opening...
GENERAL
What is meant by homeostasis? Why is it important to life? How is the view of a dynamic cell surface important to understanding how change is important to cells?
How can tissue specialization by helpful to organisms?

DIGESTION
What is the digestive function of the stomach; liver; pancreas, duodenum; large intestine?
How do hormones have an effect on digestion? How does the nervous system control digestion?
What is the pH in the stomach and how is that important? Is it the same in the small intestine?
Why don’t the organs that make digestive juices get digested themselves?
What causes the flow of digestive juices in the stomach; the intestine; the liver; the pancreas?
What are carbohydrases, lipases, nucleases, proteinases, peptidases?
How does food get to the rest of the body after digestion? How is there a constant food supply to cells even if you don’t eat one meal?

KIDNEY
In which direction will water move when there is a gradient from higher to lower salt concentration across a semipermeable membrane?
What kinds of things influence the permeability of the kidney cell membranes?
What is the difference between blood and plasma; plasma and kidney filtrate; filtrate and urine?
What is the functional unit of the kidney? What specialization of parts has occurred for different functions in the nephron?
What is the difference between the osmotic problem of an organism in fresh water and one in sea water? How are the ways they have solved these problems different?
Distinguish between hypotonic, isotonic, hypertonic fluids.

CIRCULATION
Trace the flow of blood through the heart of a fish and of a mammal. To and from which chambers does blood go to and from the body and lungs? Where is oxygenated blood found in the fish heart; the frog heart, mammal heart?
What is the difference in response of the heart to the sympathetic and parasympathetic nerve stimulation?
What factors alter blood pressure and heart rate? What is the difference between arteries, veins, arterioles, venules, capillaries?
How is the blood important to homeostasis?

NERVOUS SYSTEM
What is meant by depolarization of a membrane? What happens to the flow of Na+ and K+ after stimulation? How is the normal ion content reset after the stimulation is ended?
What is a synapse, and where is it found on a nerve cell? Is it one way? Which way? Is the action potential passed across the synapse to the next cell? At which levels of the synapse can drugs interfere with neurotransmission? Name two neurotransmitters and tell the difference about where they are found, in which divisions of the nervous system.
What is the difference between a sensory afferent neuron and a motor efferent neuron? What is an interneuron? Where are the cell bodies of these three types of nerve cells; and how is a reflex arc arranged? How is it different in the autonomic nervous system?

What part of the brain is the seat of consciousness and thought? What regions are specialized for vision, hearing and sensory sensations from the whole body? What part is needed for commands to the muscles to do voluntary acts? What part of the brain is most important in coordination and body position information?

SENSE ORGANS

What kinds of cells are important in vision? What makes them light sensitive? What is different about sensory cells and nerve cells? How are nerve impulses coming from the eye to the brain different from those of the ear or nose or taste? How is sound transmitted to the inner ear?

How is the regulation of ion flow different in rods and cones from that of other normal cells?

BLOOD TYPES AND RESPIRATORY PIGMENTS

What pigments carry oxygen in clam blood, worm blood, human blood? What is an oxygen dissociation curve and how is it affected by high CO2 concentration or acidity in the blood? What is the significance of the sigmoid shape of the curve?

Does myoglobin have a higher or lower affinity for oxygen than hemoglobin? How is this an advantage to the muscle cells?

What is an antigen, and antibody? Name some red blood cell (RBC) antigens. What is a histocompatibility antigen?

What genes can you have if you are blood type O, A, B, AB? What type of antibodies to RBC antigens do you have in your plasma if you have each of these blood types?

IMMUNE SYSTEM

What is the clonal selection theory? What are the differences between B and T cells and macrophages? Which secrete antibodies? Where are they located? What is a mechanism for killing foreign invaders such as bacteria? How is that different from that for viruses? What is the problem to the immune system caused by AIDS virus?

HORMONES, BIORHYTHMS

Why do hormones only effect certain cells? What is the difference between the mechanism of steroid hormones and peptide hormones? What is a second messenger? What is meant by amplification of a signal? How are the nervous system and endocrine system interrelated? How are they different in the way they control processes?

What kinds of factors may be involved in circadian rhythms?

How are hormones important in homeostasis? How are they important in development? How are they important in metabolism?