

Review sheet for the material covered by exam I

WARNING: I have tried to be complete, but I may have missed something. You are responsible for *all* the material discussed in class. This is only a guide.

NOTE: the extra material I provided is *not* on this review sheet (you are *still* responsible for this).

1) Tissues

What is a tissue? What are the four main tissue types? Subtypes? What do these different tissue types do? Where are they found? How do they come together to make up organs? Organ systems? What do these tissue types look like?

2) Homeostasis

What is homeostasis? Be able to give some examples of homeostasis? How can temperature be regulated? Exchanged? What are the mechanisms that let you do this? What is a homeotherm? Ectotherm? Endotherm? Poikilotherm? Why do you usually have to specify a time to determine if an animal is a poikilotherm?

How does an animal adapt to changing temperatures? What behavioral mechanisms are available? What physiological mechanisms are there (particularly for humans)? Can dogs sweat? If not, how do they cool themselves?

What is hibernation? What is the advantage of hibernating? Do bears hibernate? What is the problem with bats and hibernation? How do ectotherms hibernate?

3) Digestive system

How do animals get food? Be able to give some examples. What is a carnivore? Herbivore? Omnivore? What are the reasons for feeding? How do plants “feed”?

What are the main molecules that provide energy? How is excess energy stored in the long term? Short term? What happens if energy balance stays in deficit?

What are raw materials, and where do we get these?

What are essential nutrients? How are these different from raw materials? How many different kinds of essential nutrients are there? Make sure you look over the table of vitamins (see notes for table number).

What are the four steps in processing food? What is a gastrovascular cavity?

What are the parts of the digestive system, and what happens at each step?

- What is the oral cavity for, and why is taste so important? Other than taste, what else happens in the oral cavity?

- How does the esophagus work? Describe peristalsis. What happens when the cardiac sphincter doesn't work correctly?

- What does the stomach do? What chemicals/enzymes are released here? How are they changed? What do they do? What is the function of the pyloric sphincter?
- What does the small intestine do? What enzymes are released in the duodenum? Make sure you know what each of these does. Where is the duodenum? Where does bile come from?
- How are nutrients absorbed? Where are they taken? What is unique about fat? How does the structure of the small intestine help in absorption of nutrients?
- What does the liver do?
- What is the function of the large intestine and what happens when it does not work correctly?
- How do animals deal with the digestion of cellulose? What adaptations are there to handle this? Be able to describe each of these adaptations.

How is digestion controlled? What is the role of gastrin? Where is it released?

4) Respiratory system

What is a respiratory organ? Why do we need one? What different kinds of respiratory systems are there in the animal kingdom? What do all of them share?

Make sure you understand how each of the following works, and is used:

- skin / gills / trachea / lungs

What are the limitations of using only skin as a respiratory organ?

How do gills work? How are they made more efficient? What is a counter current system? How is the surface area of gills increased?

What are trachea? How are they used? How can body contractions help?

How do lungs work? What is the function of the trachea (NOT as in insects - notice that these structures have the same name)? What do the cartilage rings do? What are bronchi? Bronchioles? Alveoli? How are the lungs kept clean?

What is positive pressure breathing? Negative pressure breathing? What muscles are involved in helping humans breathe? Why do we not have the most efficient lungs (who does)?

How do we control breathing? What is the role of CO₂? O₂? How does hemoglobin transport oxygen? What is hemocyanin? How is CO₂ transported around to the lungs? What reactions are involved, and what is the role of hemoglobin and H⁺ in this? What buffers the blood?

5) Smoking

- What are the dangers of smoking? What does smoking do the lungs? What diseases can smoking cause? What cancers become more common with smoking? What other negative

effects does smoking have? How many people (in the U.S.) are killed each year due to smoking? What are the benefits of quitting smoking? How many years earlier does the average smoker die than the average non-smoker?

6) Circulatory system

- What is the function of a circulatory system? Why do we have one? What can some animals do that don't have a separate circulatory system?
- What is the difference between an open and closed circulatory system? Know some animals in with each type of system.
- What does the atrium do? The ventricle? Arteries? Arterioles? Capillaries? Venules? Veins?
- What is the flow of blood through the adult mammal (e.g. human)? How is it different in the fetus? What special adaptations does the fetus have? Where does the fetus get Oxygen?
- Know all the parts of the human heart (e.g., right atrium, left atrium, right ventricle, left ventricle, the various valves, main blood vessels, etc.). What do these do?
- What is the cardiac cycle? What is heart rate? Stroke volume? Cardiac output? Systole? Diastole (be careful with the last two - they're not the same as systolic pressure and diastolic pressure). What causes the heart sounds?
- What coordinates cardiac muscle cells? What does the SA node do? The AV node? What influences the SA node? What is an EKG (or ECG)? What can it show? What do the different peaks in an EKG represent? What do the intercalated disks do? Why can a defibrillator be useful?
- What influences heart rate? What effect do hormones, body temperature & condition have on heart rate?
- What is blood pressure? What systolic pressure? Diastolic pressure? How do we measure blood pressure? What units are used? Why do we have a minimum blood pressure? How does a sphygmomanometer work? What happens to blood pressure as we move away from the heart? In the capillaries? In the veins?
- What structures do veins have to help move blood back to the heart? What else can help move blood back to the heart?

[Rest of circulatory system continues in review notes for exam 2]